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STUDY OF THE FECAL BACTERIAL POPULATION OF CHIMPANZEES

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Aerospace Medical Division
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Holloman Air Force Base, New Mexico

The animals used in this study were handled in accordance with the "Principles of Laboratory Animal Care" established by the National Society for Medical Research.

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STUDY OF THE FECAL BACTERIAL POPULATION OF CHIMPANZEES

Phyllis E. Riely

FOREWORD

This is the final report of a study conducted both in the Life Sciences Division of the Paul Moore Research and Development Center of Fairchild Hiller Corporation (Republic Aviation Division) at Farmingdale, L. I., New York and at the 6571st Aeromedical Research Laboratory, Holloman Air Force Base, Alamogordo, New Mexico, under Air Force contract AF29(600)-4991. This study was initiated by Air Force technical monitor Robert H. Levenson, Captain, USAF, VC and finished under the monitorship of Donald C. Van Riper, Captain, USAF, VC.

This study was begun under the direction of Dr. Lorraine S. Gall and completed by Mrs. Phyllis E. Riely in conjunction with Mr. Darrell Beard and Dr. Helen E. Osburg under the supervision of Dr. James D. Gatts, Chief of the Life Sciences Division. The author wishes to thank the above personnel for their invaluable cooperation and assistance, and in addition to give technical credit to Shirley Dunwoody, Jaquelyn Miller, Fay Ames, Patricia Sterry, Charlotte Titus, Nancy Reardon, Carolyn Byers and Larry Peyser.

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This technical report has been reviewed and is approved for publication.

C.H. Kratochvil, Lt Colonel, USAF, MC
Commander

ABSTRACT

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Cultures isolated from rectal swabs obtained from one hundred chimpanzees, as well as from two fecal samples from five chimpanzee handlers, were studied. The data obtained from the aerobic bacterial studies were summarized in tables grouping the occurrence of the Enterobacteriacea, streptococcus, and miscellaneous aerobes so that comparisons could be made with the results obtained on two prior studies. The data of the occurrence of the anaerobic bacterial cultures were summarized in tables as obligate or facultative anaerobes, using the same method of grouping the cultures as in prior studies. Differences in the anaerobic character of chimpanzees and human fecal populations was noted; the percentage of obligate anaerobes exceeding 90% for the human cultures, and ranging between 26% and 71% for the chimpanzee cultures. A literature survey was conducted to aid in the evaluation of the potential pathogenicity of bacterial strains isolated from the chimpanzee. A remarkable similarity exists in the aerobic flora of primates, although differences in the pathogenicity of particular species of bacteria for various primate hosts have been reported in the literature. Carrier states are prevalent in the chimpanzee. The anaerobic fecal population of the chimpanzee differs from man.

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SECTION I

INTRODUCTION

The normal flora of the alimentary tract of chimpanzees in captivity was determined under Contract AF29(600)-4124[1] and the effect of diet on this flora was studied fully under Contract AF29(600)-4555[2]. This baseline information is valuable in the medical care of chimpanzee colonies since many illnesses and deaths of chimpanzees have been attributed to inflammatory diseases of the alimentary tract. In a broader application, this fecal flora serves as a baseline to calculate possible effect of varying stresses and their significance as applied to man's nutritional state. It is recognized that the chimpanzee is one of the key experimental animals used in preparation for manned space exploration and, therefore, it is essential to establish the relationship between the normal alimentary flora of chimpanzee and man as well as correlating this flora with other primates.

To determine the potential pathogenicity of bacterial strains isolated from the feces of chimpanzees at the 6571st Aeromedical Research Laboratory, a survey of the literature was conducted.

ENTEROBACTERIACEAE

Monkeys have many of the same bacterial inhabitants of the gastrointestinal tract as do men. Within the family of Enterobacteriaceae, the tribes are not sharply differentiated and there are many intermediate forms with their own biochemical reactions which are reproducible, but which do not appear to place them in a particular tribe. The pathogenicity of these tribes is still the subject of discussion among bacteriologists, although shigella and salmonella are usually considered pathogenic; and at least some species of these genera cause serious illness in monkeys as well as in men.

The study of the flora of the intestinal tract of monkeys and apes is remarkable in the paucity of data available. However, in one study done by Dietrich[3], stools of 237 Macaca mulatta were cultured shortly after their arrival in the United States from India. The results of that study show the presence of several gram negative rods and Candida sp. The occurrence of the various types of proteus and paracolon organisms is not unexpected, but it is surprising to find the negative cultural findings on 35 or 13.7% of the monkeys tested. The low rate of isolation of shigella and salmonella in these healthy monkeys was commented on by Dietrich[3] as being unusual in view of Hardy's[4] findings that shigella and salmonella were widely present in primates. Schneider et al[5] in their publication on studies of pathogenic enteric bacteria in a large primate colony stated that monkeys are often asymptomatic carriers of shigella and salmonella as 28 of 92 apparently healthy animals were positive for one of these two bacteria in their study. This finding was confirmed by further studies on 3193 healthy rhesus and 1219 healthy cynomolgus monkeys at different seasons of the year which showed an overall recovery of shigella in 21.5% of the rhesus and in 4.3% of the cynomolgus monkeys. In the summer the highest percentage of shigella occurred in the rhesus and the lowest in the other monkeys. Salmonella was found in 11.1% of the rhesus and 15.5% of the cynomolgus monkeys with the highest incidence in the summer.

Schneider[5] also noted the natural spread of shigella and salmonella among associated animals and found that shigella was transferred readily to other animals, while salmonella did not spread rapidly. These authors also found that the potentially pathogenic serotypes of E. coli, 0-111 and 0-55, were readily isolated from apparently healthy monkeys. The strain 0-111 was found in about one-third of 75 animals studied.

In 1934, Dack and Petran[6] recognized that enteritis in monkeys was caused by organisms which also infected man. It was also established by Rewell and Bridges[7] and Cruickshank and Bray[8] that shigella infection was responsible for the deaths of monkeys in various shipments. An interesting study performed by Galton et al[9] in which 500 fecal cultures from chimpanzees and monkeys were examined, found that 72 shigella and 22 salmonella cultures were positive which was in contrast to 95,000 fecal cultures from humans in the same locality with recovery of only 2 shigellas. In Cook's[10] recent studies in which 339 monkeys were cultured, 129 carried shigella of varying types without symptomatology. In another study by Barnes et al[11], 787 rectal swabs were obtained from monkeys and 157 positive shigella strains were recovered. Shiga bacillus is the organism causing the most severe entertis in man, but no Simian infections with or without symptoms have been reported. In contrast Sh. schmitzii is the type found most frequently in apes and monkeys.

In an excellent book, "Comparative Pathology in Monkeys", Lapin and Yakovleva[12] stress the fact that the diseases they describe are diseases under the specific conditions of the Sukhumi animal house. These conditions do not duplicate normal habitat, but are probably duplicated in many animal houses. The material is based on dissection of a thousand monkeys. The authors succeeded in demonstrating that the strains of dysentery bacilli obtained from men are almost nonpathogenic in monkeys, but, conversely, most of the animals die from dysentery. The authors also discuss tuberculosis and note the apparent paradox that experimental infection and natural disease are theoretically different things. Paradoxical findings on the comparatively high resistance of monkeys to dysentery and tuberculosis follow naturally from the data on the low morbidity of animals in the main group, especially those living in open air cages.

"Many scientists have published articles on dysentery in monkeys[13,14,15,16,17,18,19,20,21,22,23,24,25] and ... Several of these authors note the prevalence of the carrier state without any clinical symptoms of the disease. An outbreak of the disease usually causes the death of many animals."[12] Dzhikidze[25] found no distinct seasonal variations in the spread of dysentery and felt that Flexner's bacillus was the most common agent. Many of the authors noted that an increase in the number of cases of dysentery usually coincided with the arrival of new animals. There is a marked difference in the colitis rate of animals that have been in the monkey house for a long period of time in contrast to the newly arriving. For example, 14% of newly arrived monkeys carried Flexner's bacillus and 11% died, while the main group included 21% carriers with only a 3% incidence of active dysentery. Data collected in 1957 when 400 Indian monkeys were delivered indicated 76.5% of these animals were sick and 64% carried identifiable Flexner-type bacilli. Of those carrying the bacillus, 31% died. During the same period, the main group of 600 monkeys included 32.5% carriers and only 4.3% were sick and eventually 13 died (2%).

The part played by Morgan's bacillus in the pathology of man is still undefined. Lapin et al[12] felt that Morgan's bacillus should be classified with proteus and attributed 35% of the summer diarrhea to infection with Proteus sp.

Salmonellae pathogenic for animals show a particular pathogenesis which might be classified as hemorrhagic ulcerative colitis. There appeared to be a small number of paratyphoid carriers in the main group of monkeys in the Sukhumi monkey house. Paratyphoid did not appear to be prevalent as a disease in monkeys[12].

"The macaque and the chimpanzee, especially immediately after importation, may harbor Sh. dysenteriae, Sh. flexneri, or Sh. sonnei, and the infection may be mixed, an animal being simultaneously infected with more than one strain of shigellae or with both shigellae and salmonellae. Although acute shigellosis has occurred in Ateles and Cercopithecus, there is no body of information on incidence and strains in New World and African monkeys as there is for macaques and chimpanzees. The few reports of types indicate no unusual forms.

The Flexner bacillus is notoriously heterogeneous, and the mulatta macaque may have its own variant, the Mulatta type (=4b) having been encountered in several shipments. This strain is relatively rare in humans. Fortunately, as far as danger to man is concerned, it is type 2 (Schmitz' bacillus) rather than type 1 (Shiga's bacillus) of Sh. dysenteriae that naturally infects simians, and an experimental study indicates a resistance, at least in mulatta macaques, which would preclude their participating in human epidemics caused by Shiga's bacillus"[12].

The primates, including man, present a particular problem in relation to the carrier state since many animals and/or men remain apparently healthy despite the presence of large numbers of potentially pathogenic organisms in the stools. This is particularly important in connection with bacillary dysentery since there are many reported cases of unapparent shigella infections which were followed by the outbreak of frank infections. The only bacteriologically discernable difference in the existence of shigella between healthy and sick monkeys is in the number of colonies present upon culture of the stool. The lightly infected animals represent a threat both to monkeys and to man; as it is difficult to properly weigh the part that natural resistance plays in susceptibility to shigella. Since it was shown by Dzhikidze[26] that healthy monkeys may carry and pass shigella temporarily, it was felt that no chronic carrier was truly healthy even though its general condition had not been obviously effected. "When a monkey is living in equilibrium with shigellae, dietary deficiency or any of many other stresses (transportation, experimental and natural infections, surgical operations, pregnancy and lactation, etc.) may upset this balance in favor of the bacilli."[27]

The most dramatic incidence was reported by Bach et al[28] when three of the victims, all children under five, died. As was documented by Snijders[29] and by Carpenter and Sandiford[30] the shigella which infects monkeys may also cause dysentery in man.

The usual source of salmonellosis is from another animal, although food, rodents, and contaminated eggs have been indicted as sources of infection. The incidence of salmonellosis in laboratory monkeys varied greatly. For example, Habermann and Williams[31] found salmonella in 19.5% of a large series of monkeys while Garner and Morales[32] found the organisms in over 60% of a 500 sample. In these surveys most of the infected animals were apparently healthy.

MYCOBACTERIUM

All the available data on tuberculosis in monkeys indicate that the animals are highly susceptible to this disease. Records from the monkey house determine that roughly 6.5% of the deaths were due to tuberculosis. It was difficult to ascertain whether the rate of tuberculosis was due to infection spread by new shipments of monkeys, overcrowding of monkeys during shipping, or increased susceptibility due to lowered resistance.[12]

In some of the earliest works on the management of captive primates tuberculosis ranks among the leading causes of death[33]. It is extremely difficult to use the tuberculin test to determine infectivity since many of the animals prior to death become anergic and it is impossible to determine via a skin test the presence of tuberculosis. All three types of tuberculosis have been found in monkeys although they seem less susceptible to the avian strain of the bacilli.[34] Importance has been attached to the spread of tuberculosis via gastrointestinal tract and the eating of food contaminated by feces carrying the tubercular bacilli.

A study by Habermann and Williams[31] showed an infection rate of 21.5% among 615 necropsys of Macaca mulatta. A tropical laboratory posted 539 new world monkeys and found no evidence of tubercular leisions[35]. This would seem to indicate that tuberculosis is rare in monkeys in their natural habitats. Difference in species resistance has been claimed by many workers, but has never been documented.

PSEUDOTUBERCULOSIS

Pseudotuberculosis which is due to a gram negative bacillus of the pasteurellae group appears to be fairly prevalent in monkeys. The clinical signs include a mild diarrhea and little is known about the natural mode of transmission, although monkeys may contract it by eating food contaminated by rats. There have been some reports of transmission of this disease to humans from monkeys.

STREPTOCOCCICOSIS

It is possible that massive infection of hemolytic streptococci may be diagnosed from fecal cultures. This particular bacteriological agent should be considered in diagnosing acute febrile illnesses.

MYCOSIS

The use of antibiotics has brought bacterial diseases under greater control, but has allowed yeast and fungi to become a greater problem. These mycotic organisms may become prevalent in the normal flora if suppressed or destroyed. Some of the mycotic lesions were found to be due to coccidioidomycosis and cryptococcosis or torulosis. Yeast-like fungi of the genus Candida are normal residents of the mouth, intestinal tract, and skin of monkeys and tend to be secondary invaders. Aspergillosis may be either a secondary or primary invader. The seven species of Candida commonly isolated from man are: albicans, tropicallis, pseudotropicallis, krusei, parakrusei, guilliermandi, and stillatoides. <u>C. albicans</u> is most frequently pathogenic, but <u>C. tropicalis</u>, <u>C. pseudotropicalis</u>, <u>C. krusei</u> and <u>C. guilliermandi</u> have been reported as causes of human disease. <u>C. albicans</u> has been isolated from 15% of fecal samples of normal human beings.

SECTION II

METHODS

The methods for collecting and culturing the fecal samples from the chimpanzees by both aerobic and anaerobic techniques are described briefly in this section while details of the bacteriological techniques and media are contained in Appendix I. The animals sampled are shown in Table 1.

1. Collection of Samples

Two samples were collected from the rectum of each chimpanzee tested by swabbing the rectum with dry "swubes" (swabs with a protective plastic sheath), which were placed immediately into broth. One swab was placed into 0.5 ml Gall's broth and was used for the aerobic culturing, while the other swab was placed into 1.0 ml of Gall's broth to which had been added enough cysteine to reduce the potential of the medium to approximately -200 mv. (The composition of Gall's broth and the cysteine solution are described in Appendix I).

2. Bacterial Culturing Techniques

Both the aerobic and anaerobic primary culturing of the samples were done immediately in the field laboratory at Holloman Air Force Base by inoculating the specified media and incubating at 37°C. All cultures showing growth were transported to the Republic Aviation Division Laboratory for further study. All broth cultures were transferred to solid media prior to transport.

The aerobic culturing of the rectal samples was carried out on various differential media designed to selectively culture certain types of bacteria. MacConkey's, Bismuth sulfite (BS), Salmonella-Shigella (SS), and Tetrathionate broth were used to isolate Enterobacteriaceae from the feces. Mitis Salivarius (MS) and Phenylethyl Alcohol (PEA) were used for streptococci and staphylococci, while Rogosa's agar as a pour plate was employed for lactobacilli. Phytone-yeast agar slants were used to isolate fungi. Blood agar plates were used to culture fastidious bacteria not encouraged by the other media. An aerobic counting plate was also made from each sample. The plates were read after the appropriate incubation period, sealed with plastic rings, refrigerated and returned to the central laboratory at Republic for further processing, where selected colonies from each plate were picked into nutrient broth, Gram stained and separated into the proper category for identification as indicated for each type of culture in Appendix I. Tetrathionate broth showing growth was immediately inoculated on BS, SS, MacConkey's and Brilliant Green agar which were incubated, and returned to Republic for study and identification as above.

The anaerobic culturing of rectal samples was performed immediately by the serial dilution of the sample in Gall's broth made anaerobic by the addition of cysteine, as shown in Appendix I, and incubated anaerobically. When growth was observed, agar shakes of the cultures were made to allow transport of the cultures to the Republic laboratory. In addition, two anaerobic pour plates were made from appropriate dilutions of the fecal samples and a blood plate was made from all samples and incubated anaerobically. The details of these primary isolation procedures are contained in Appendix I.

The agar shake cultures, the cultures on anaerobic Petri plates and blood agar plates, were sealed and refrigerated until returned to the Republic laboratory for further study. The anaerobic cultures from the agar shakes representing the top three dilutions of fecal material and the colonies from the anaerobic Petri dishes were purified when necessary and were studied by means of screen tests to allow their comparison with a "key" setup in the Republic laboratories with the anaerobes isolated from human feces. The colonies on the blood plates were picked into nutrient broth, Gram stained and separated into the proper category for further study leading to their identification. Details of the procedures used to screen test the anaerobes and identify the cultures from the blood plates are contained in Appendix I.

A Gram stain was made from the original aerobic swab of the rectal sample, and was observed for the morphological types of bacteria present.

The data obtained from the aerobic bacterial studies were summarized in tables grouping the occurrence of the Enterobacteriaceae, streptococci and miscellaneous aerobes so that comparisons can be made by sampling period and also for each animal. The data of the occurrence of the anaerobic bacterial cultures were summarized in tables as obligate anaerobes or facultative anaerobes, using the designation derived from the anaerobic "key" so that the same comparisons can be made as for the aerobic cultures.

SECTION III

DISCUSSION OF RESULTS

The work under this contract, while emphasizing any potential pathogenicity characteristic individual bacterial isolates, has included the isolation and identification of all bacteria appearing on the fecal swab sample obtained from both the chimpanzee handlers and the chimpanzees. This work is grouped and discussed as to the various bacterial strains isolated.

In a comparison of the aerobic microorganisms found in human feces as established by Rosebury[36], the NASA study[37], and the two Air Force studies [38, 39] as well as those with the chimpanzee are shown in Table 2, it becomes apparent that little difference exists in the total microbial population. The individual variation between animals is very similar to that observed in the human studies as is the change brought about by various dietary regimens. The only exception is the isolation of Mycobacteria from chimpanzees and handlers in the last field trip of the present study. This was the only sampling period in which specific media were included for the detection of this particular group of microorganisms.

STREPTOCOCCI

Based on biochemical and physiological activity, the aerobic and facultative anaerobic species of streptococci have been divided into four main divisions consisting of (1) hemolytic pyogenic streptococcus, (2) viridans streptococcus, (3) lactic group of Streptococcus lactis, and (4) enterococci.

The comparison of the streptococcus appearing in the fecal samples is shown in Table 3. Str. salivarius and Str. mitis as well as enterococci were recovered from almost every sample of every animal. In addition, a group F streptococci was recovered from many animals and is listed under the "non-types" with an asterisk to denote possible pathogenicity. This beta-hemolytic streptococcus recovered from the blood plates and listed as untypable has been identified as a member of the streptococcus Group F Lancefield classification, but with no specific serotype, as determined by Dr. Rebecca Lancefield of the Rockefeller Institute of New York. This round coccus forming short chains is most easily isolated under anaerobic conditions. It ferments inulin, lactose, sucrose and glucose, shows slight fermentation of raffinose, glycerol, sorbital, and mannitol, forms a soft, acid curd in litmus milk with partial or no reduction, and produces a pH of four in one percent glucose broth in twenty-four hours. Sporadic isolation of Type C and G and occasionally Type A members of the Streptococci occurred. With the exception of the first sampling period on the present contract, distribution of the cultures remained relatively stable. In this first sampling period, many facultative members of the Enterococci were recovered and their occurrence might indicate an endemic situation. During the last field trip, the chimpanzee handlers were sampled and carried Str. salivarius and only an occasional isolation of Enterococci was noted (Table 4).

CORYNEBACTERIA

The occurrence of Corynebacteria during the fourth sampling period of this contract is shown in Table 5 . This table indicates that Corynebacterium xerosis was the most frequently isolated member of the Corynebacteria and appeared on all but two of the men and on four of the chimpanzees. These isolations of Corynebacterium point out the nonprevalent character of this organism in the bacterial flora of the intestine. The isolation of three members of Corynebacterium acnes from the intestinal flora of the chimpanzee is interesting.

SPIROCHETES

Although the recovery of Spirillum from the intestinal tract of chimpanzees and men is documented in Table 6, its significance is unknown. According to Ruch[27] its presence has been reported in the intestinal tract, but no pathological correlations have been made; although he felt that intestinal diseases might favor the multiplication of spirochetes. These cultures were obtained from deep blood flasks and the identification was based on morphology using a Fontana stain.

PPLO

The presence of PPLO as shown in Table 7 would indicate that a substantial portion of the chimpanzees carried some form of mycoplasma. Bacteriologists differ in their interpretation of the significance of the isolation of PPLO. When it is found in the urogenital tract it is felt to have pathological significance. We have isolated it in many instances from the top dilutions of fecal cultures of both men and chimpanzees. If, for no other reason than the confusion its undetected presence brings to the biochemical identification of cultures, it is important. Much work remains to be done in determining the physiological significance of its presence either to the host or to the other microorganisms in the intestine.

MISCELLANEOUS AEROBES

In the comparison of the miscellaneous aerobes recovered from feces, as shown in Table 8, a beta-hemolytic gram positive rod was isolated twice from Denise, Donald, Manuel, Mark, Mimi, Red and Sonia, and once from Elbys, Phil, and Randy. This organism has been identified tentatively as a strain of Clostridium aerofoetidum which had become oxygen tolerant.

Several animals seemed to carry coagulase positive strains of staphylococci as part of their normal microbial flora. Although it was not isolated at every sampling period from these animals, it was recovered at many sampling periods over a long period of time. Among the sporadic isolations of staphylococcus, two potential pathogens were detected (mannitol salt coagulase positive strains); one on Penny (Holloman #276) and the other on the handler, A. Taylor.

A few cultures of haemophilus were observed. According to Rosebury[36], this species has not been recorded as part of the intestinal microflora; however, we have frequently observed its presence both in men and chimpanzees, but have attached no medical significance to its presence.

FUNGI

The types of fungi isolated from the 100 chimpanzees are shown in Table 9. Members of the Candida sp. group were the most frequently isolated microorganisms. Candida sp. occurred in 31.4% of the animals, C. albicans in 40%, and C. tropicalis in 2.9%. Trichosporon sp. showed a consistent occurrence in some animals; for example, Donald and Elbys as well as Manuel, Mark, Mimi, Randy, Red and Sonia carried these organisms in more than one sampling period.

ENTEROBACTERIACEAE

The fecal samples from 100 chimpanzees were plated on MacConkey's, EMB, and cultured in tetrathionate broth. Fifteen percent of the samples showed no coli present with the method of sampling; i.e., a fecal swab taken from the rectum of the chimpanzee and was placed immediately in Gall's broth, mixed thoroughly, and 0.1 ml of this broth was plated directly onto the differential media, and 0.5 ml was placed in tetrathionate broth. This percentage of nonrecovery correlates closely with Dietrich[3] who had negative cultural findings in 14.7% of the monkeys he tested. The relatively low incidence of Shigella (2.4%) and of salmonella (8.3%) also agrees with Dietrich's study[3]. The incidence of proteus was quite high; positive results occurring in 43.5% of the animals. Pseudomonas occured in 11.8% of the animals, alkalescens dispar in 4.7%, klebsiella in 3.5%, aerobacter in 31.8%, and typable coli in 4.8%. On the whole, the animals sampled during this particular contract showed a much lower incidence of potentially pathogenic members of the Enterobacteriaceae than did those animals cultured in the prior two studies[1,2]. Whether this is an indication of improved handling conditions, stabilization of diet, or of medication has not been determined.

In the comparison of the Enterobacteriaceae from animals which were sampled repeatedly, it is interesting to note that certain types of bacteria seemed to be found consistently, while those members of the Enterobacteriaceae suspected of potential pathogenicity were isolated sporadically. In an attempt to establish a diet or stress factor in the occurrence of these sporadic isolations, it was noted that change in diet appeared to be associated with the isolation of a variety of strains and would indicate a state of flux or confusion in the gut. This is probably the result of a change in the nutrients being supplied to the bacteria and the competitive efforts of various strains which take place prior to the establishment of the predominance. These data should be correlated with the corresponding anaerobic data since the anaerobes may produce a substance which keeps the aerobic population in check[40]; and the anaerobes are much more diet-dependent[2]. If the number of anaerobes is substantially reduced, a predictable rise in the number of potential pathogens may occur. Since many different media are used for the recovery of the aerobic fecal population, it is felt that the results in Table 10 represent a true picture of the predominating bacterial populations at each particular sampling period. For example, gram negative rods which were recovered on blood agar were also screened to determine their correlation to those found on the selective media. The indigenous status of aerobacter was established by its repeated recovery from those animals in which it occurred. The potential pathogenicity of coli as established by the Table 11 indicates that several pathogenic types have been isolated from these animals including Poly A, 0111:B4 and Poly A 055:B5. The typable coli found on the chimpanzees are shown on Table 10. Not as many typable coli were found in this particular contractual study and this may be an indication of the improved health status of these animals. At least it is another indication, as is the lower prevalence of shigella and salmonella, of the state of the health of the animal. The increased incidence of proteus cultures does not seem to indicate an adverse condition in the intestinal flora of the chimpanzee.

There are many biochemical patterns established by different strains of Enterobacteriaceae which are repeatable, but do not seem to fall in the recognized classification as established by Edwards and Ewing[41]. For this reason, Patterns A through K have been included in our identification schema and their biochemical patterns are shown in Table 12. Pattern B may be a strain of citrobacter which is indol positive. Pattern E would fall into the older classification of Proteus inconstans, but since Edwards and Ewing[41] did not use this particular classification, we have included it as a pattern. Pattern K closely resembles providence differing in the fact that the majority of providence strains do not ferment sucrose while this strain does.

MYCOBACTERIA

Lowenstein's medium was inoculated from samples of the feces of the chimpanzees and of their handlers. Repeated smears were made from the cultures showing growth and were stained by the Ziehl-Nielsen Method for acid-fast bacilli.

Few of the smears showed organisms typical of Mycobacteria sp., but many smears showed acid-fast granules, partially acid-fast microorganisms and acid-fast bacilli of morphology not typical of mycobacteria. However, Mycobacterium tuberculosis has a complex life cycle which includes a variety of forms ranging from overall granules to long filaments and bizarre forms can be induced under treatment with chemicals or antibiotics. In Table 13, microscopic identification by Ziehl-Nielsen stain of the cultures on Lowenstein's medium is tabulated: presence or absence of acid-fast material is noted and the bacteria observed are classed as being typical or atypical of Mycobacterium tuberculosis. The original cultures, and also subcultures to fresh Lowenstein's medium, are still under incubation. Subcultures have also been made to Lowenstein's medium containing 3.5, 10, 100 Mcg. streptomycin, 10, 100 Mcg. PAS, and 0.2, 1, 5 Mcg INH (isoniazid). Results will be reported following further incubation.

LACTOBACILLI

The lactobacilli, including many of the fecal anaerobes, comprise an ill-defined genus of the family Lactobacillaceae. These gram positive micro-aerophilic or anaerobic rods show varying morphological and physiological characteristics. In man and primates, lactobacilli are found in the mouth and lower intestine[42]. Both saprophytic and parasitic species are regarded as important to the well-being of the host since substances produced in the course of their metabolism may be beneficial or deleterious[36].

Lactobacilli were recovered from 75% of the fecal cultures of the 100 chimpanzees. During the fourth field trip a more intensive study of the lactobacilli was carried out, including optimal temperature, salt tolerance, fermentation of mannitol, mannose, and arabinose as well as the reaction in litmus milk. These organisms were then keyed according to Rosebury[36]. (Table 14)

Lactobacilli have been classified as homofermentative and heterofermentative. Homofermentative lactic acid bacteria (in which group the lactobacilli are often placed) produce chiefly lactic acid from glucose by means of one pathway, while the heterofermentative bacteria produce lactic acid and a variety of end-products by another pathway.

During the last field trip both homofermentative and heterofermentative species and varieties were isolated from the feces of the chimpanzees and from the feces of the animal handlers. A difference, probably due to dietary influences, was noted in the isolations from the humans and the chimpanzees. L. casei, a lactobacillus associated with milk and cheese products, was isolated in three instances from the feces of the animal handlers, but was not recovered from the feces of the chimpanzees. Many more representatives of the heterofermentative group IV, L. fermenti and its varieties, were recovered from the chimpanzees. A number of atypical varieties were isolated from the chimpanzees but not from the humans. These may be organisms peculiar to primates other than man.

FECAL ANAEROBES

Using techniques similar to those employed in this study, the predominance of anaerobic bacteria over aerobic bacteria in the feces of the chimpanzees and humans was demonstrated in work done under contracts[1,37]. In all these studies the overall average difference between anaerobes and aerobes exceeded 1000. In the Wisconsin study[2] various diets seemed to influence the anaerobic population with the percentage of strict anaerobes to facultative anaerobes ranging between 19% and 65%. This is in marked contrast to human studies where the obligates exceed 90% of the total anaerobic population. In this study, the first two field trips showed a marked predominance of facultative organisms (74% to 26% and 71% to 29%) while in the last two field trips, the obligate anaerobes predominated (67% to 33% and 61% to 39%).

In Table 15 the comparative degree of anaerobiosis is shown by a comparison between the height of growth as shown by the anaerobic tube designation and the aerobic plate count. This indicates a difference between the aerobic and anaerobic bacterial levels of at least two logs and as many as four logs in some instances. These differences are of the same order of magnitude as those encountered in the prior two studies of the chimpanzees[1,2].

In Table 16 the comparison of the anaerobes isolated from a particular animal at many different sampling periods is documented. In the nineteen samplings of the fecal microflora of Sonia, fairly good correlation was obtained as in the seventeen samplings of Mimi. Close correlation was also noted on animals Phil and Randy. This is in contrast to the poor correlation observed in the four samplings of Possum, the three samplings of Richie, and the two fecal samplings of Pop. Fay and Floyd showed the same degree of inconsistency as did Gloria, Gromic, and Guy. Manuel, although sampled sixteen times, showed repetition of only two cultures in the obligate anaerobic group; but better correlation was obtained with his facultative flora. Andy, Annie and Betty, while consistent in their facultative anaerobic fecal populations, showed random isolations of obligate anaerobes. Elbys was sampled a total of sixteen times and showed remarkable consistency in the types of facultative and obligate anaerobes present in his gut.

The anaerobic results obtained in the present study are similar to those found in "A Study of Bacterial Flora of the Alimentary Tract of Chimpanzees", AF29(600)-4124[1]. Table 17 shows the relative predominance of all cultures isolated during these studies as well as those isolated during AF29(600)-4555[2]. The following types, FA8, FA18, FA1, FA3, and FA17 predominate on the basic study as well as on this study. CN1, FA15, FA10 and GD3 are predominating strains on this study and the difference in these predominating organisms as well as the marked difference from those cultures isolated during AF29(600)-4555 are probably "diet dependent". "Diet dependency" includes basic nutrients supplied, length of time on particular diet, type of diet preceding present diet, and medications. Table 18 shows the predominating anaerobic cultures isolated from the chimpanzee handlers, and the predominating anaerobes isolated under Contracts NASw-738[37] and AF33(615)-1814[39]. The number of cultures from the handlers is not large enough to allow valid comparisons to be made.

The tiny anaerobes which have been isolated repeatedly from the top dilutions of chimpanzee fecal samples have not been identified. We have been unable to maintain these strict anaerobes in pure culture, and for this reason biochemical identification was impossible. We have used PPLO media with serum fraction as well as a filtrate of other fecal organisms without successful maintenance of pure culture.

The classification of the nonsporulating anaerobic bacteria is exceedingly complex and different authors often depend on a single characteristic for identification. For this reason the artificial grouping set up by Gall et al[37] has been used to separate the anaerobes. This grouping is based on both morphology and biochemical reactions as shown on Table 19. This classification uses fermentation as one of the keys since most anaerobes grow satisfactorily in the ordinary peptone sugar-water media. The most important fermentable substances are glucose, maltose, lactose, and sucrose and strongly saccharolytic species ferment all of these sugars. Those species whose activity is less may ferment glucose or glucose or maltose. Organisms which do not ferment glucose do not attack any of the sugars. Another interesting point is that lactose fermenting anaerobes are rarely truly proteolytic. "All members of the genera Streptococcus, Pediococcus, Microbacterium, a large number of lactobacilli, certain bacilli, and Rhizopus species ferment glucose predominantly to lactic acid with formation of trace amounts of volatile acids, ethanol, fumarate and carbon dioxide."[43] In addition, 'The classic procedures of microbiology provide rudimentary information on the fermentation of protein. Observations of acid production, (indicator added, change in pH, gas formation and rate and amount of growth furnish a) a means of surveying the substrates fermented and comparing the range of substrate availability among strains, species, and genera and b) a guide to products formed."[43]

In the reading of litmus milk, which is one of the primary identification points, one should remember that highly saccharolytic organisms attack the lactose so vigorously that a stormy clot results, and acid causes the casein to coagulate. Curding is also the result of the growth of some non-lactose fermenting organisms due to the fact that these organisms secret a rennin-like enzyme capable of hydrolyzing casein to soluble caseinogen which then reacts with the soluble calcium salts present in the milk to form a percipitate of calcium caseinogenate which may give a false reading.

Anaerobic cultures have been separated on the basis of morphology by many authors. The genus Fusiformis contains gram negative nonsporulating bacilli which are obligate anaerobes and may be pathogenic in some instances. Some authors divide the gram negative anaerobic rods into two groups; i.e., bacteroides which are rods with rounded ends and Fusobacteria which are rods with pointed ends.

The anaerobic cocci are a heterogeneous group of organisms for which no satisfactory classification or nomenclature has been devised. Many authors divide them into two general groups. One group is the anaerobic streptococci which are gram positive, appear in long or short chains and are either strict anaerobes or microaerophylic in their oxygen requirement. This group would be found among the following numbers: FN2, FN3, FN4.

The obligately anaerobic streptococcus were placed by Bergy[42] in the genus Peptostreptococcus and include thirteen species. Attempts to demonstrate regularly the commonly defined species from the upper respiratory and intestinal tract have not been very successful because of technique difficulties of culture.

The second group are anaerobic micrococci of varying size and shape typically appearing in masses, although pairs and tetrads have been observed. They may be either gram positive or gram negative and do not like simple media. They would correspond to the following F and C numbers: FA13, CT1.

The possible taxonomic position of the FA types is of interest and the following type cultures are probably members of the Lactobacilliaceae since they produce large amounts of lactic acid: FA2, FA4, FA5, FA11, and FA16. In addition, FA4, FA5, and FA11 may belong in this category since they are also strong acid formers. It is possible that the function in the body of this group of organisms is rather similar. This role would include the metabolism of carbohydrates with the production of lactic acid, lipase, and in certain instances the production of B vitamins. It is possible that FA2 does not really belong in this group since its morphology is more characteristic of the Eubacterium or Catenabacterium group and its function may be carbohydrate metabolism, lipase and certain B vitamin production.

The next group of organisms are the deaminating and decarboxylating group of fecal anaerobes. This group of organisms has been designated physiologically since its morphology is quite diverse and it includes FA1, FA9, FA10, FA12, FA7, and FA8. These organisms may belong to the Eubacterium or Catenabacterium group and their role in the body includes deamination, decarboxylation, the formation of lactic acids from carbohydrates, and the production of vitamin B_{12}, pantothenic acid and folic acid.

FA8 is a very tiny organism which may belong to the Dialister group. It is physiologically active producing lactic acid from glucose and converting amino acids to ammonia. It can also decarboxylate histidine and tyrosine, and produce B_{12} and pantothenic and folic acid.

Other organisms possess less homogeneous physiological characteristics. However, FA13 appears to be a veillonella and produces B_{12}, riboflavin, and folic acid. FA3 appears to be a Fusobacterium and produces small amounts of lactic acid from glucose and carries out some deamination, but is active in decarboxylation of the four amino acids tested. FA3 also produces vitamin B_{12} and is the only organism in the sixteen type cultures that produces indol. FA15, probably another Fusobacteria, produces large amounts of lactic acid as well as vitamin B_{12} and pantothenic acid.

FA14 appears to be in a category by itself because it is capable of fixing nitrogen as well as producing hydrogen and has an extremely wide temperature growth range. FA6 produces small amounts of lactic acid from glucose and has no decarboxylating or deaminating activity.

FA18, GD2, CN1 and FA6 demonstrated positive lipolytic activity as noted in Table 20. In addition, the same cultures demonstrated specific lipolytic activity when incubated with varying shorter chain fatty acids (see Table 21).

All of the in vitro work performed on NASw-738[37] as well as the work done under the present contract indicate the breadth of the physiological function of the fecal anaerobes as well as highlight the enormity of the task of determining their function in the gut.

The complex ecological role of the many different microorganisms living in the intestine is difficult to simulate and study. One approach is to determine the fundamental physiological activities of these predominant organisms in an attempt to chemically resolve their function in the body. Microorganisms may compete with the body for nutrients, produce essential nutrients, or precursors of human nutrients, or autolyze products which are toxic to the animal. Major sources of nutritional energy for bacterial metabolism are amino acids and peptides. The environment in the colon is well suited for microbial fermentation of these substrates. A study of the physiological pathways of amino acids and peptide metabolism was undertaken in order to learn more about potential byproducts of bacterial metabolism[37].

Bacterial growth involves protein synthesis. Supplies of nitrogen, carbon, sulfur are essential to this process. Even highly proteolytic bacteria will not grow when native proteins are the sole source of nitrogen. Proteins used may be dehydrolyzed proteolyses, peptones, peptides and amino acids produced by bacterial hydrolyses.

The ability of selected fecal anaerobes to produce lactic acid, produce or utilize vitamins, deaminate or decarboxylate amino acids as described in NAS-738[37] indicates the wide range of physiological activities of the anaerobic intestinal microflora. In addition to the above reactions, proteins and lipids are broken down into smaller units and synthesis of complex substances from these basic units may occur.

Lypolysis contributes a number of intermediates which are involved in the citric acid cycle, either directly or as accessory compounds. Since biological lipids are very complex substances, several enzymes such as lipases, esterases, phosphalidases act together to accomplish hydrolysis. Lipases range in specificity of action, as with peptidases from ability to split long chain lipids, to action on short chain fatty acids.

Lipo-amino acid complexes may be direct precursors of protein or in equilibrium with the precursors. Those cultures predominating in the current study were selected for a study of their lipolytic activity.

Bacto Spirit Blue Agar was prepared and the requisite amount of Bacto Lipase Reagent was added as directed[44]. Conventionally, this medium is used in the form of plates or slants on which the test organism is streaked. Positive lipase production is indicated by formation of a dark blue precipitate under the colonies. In the investigations reported in NASw-738, 'Study of the Predominating Normal Fecal Flora of Man"[37] it was found that better results were obtained when the medium was distributed in deep butts. The melted and cooled medium was inoculated with 0.1 ml of a culture of the test anaerobe. The incubated tubes were compared on successive days to the lipase controls seeded with lipase enzyme and to the uninoculated incubated controls. All determinations were in triplicate. Negative test vials showed no color change, while the positive cultures were blue as compared with the uninoculated control; though deep color was not developed. Three strong negatives were noted, a yellow color being produced in the growth column. This yellow color had been noted in the tests run with the anaerobe type cultures from humans. It may be the effect of pH changes upon the medium or might be indicative of synthetic activity. Further study would be required to explain this phenomenon.

To determine specific enzyme activity against certain fatty acids and esters, additional work utilizing Bacto Spirit Blue Agar was performed. This work is shown in Table 20. Fatty acids and esters selected on the basis of increasing length of carbon chain were added to Bacto Spirit Blue Agar at a concentration of 1%. While a blue color develops in the medium as a result of addition of the fatty acid, the reaction can be recognized by comparison with the uninoculated controls. A yellow color was observed, as in the series with added Bacto Lipase Reagent, and this color change was produced by the same microorganisms as shown in Table 21.

SECTION IV

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. A remarkable similarity exists in primates between the basic aerobic flora of man, chimpanzees, and certain species of monkeys.

2. Differences in species pathogenicity has been demonstrated in the literature (particularly in the Shigella sp.).

3. Carrier-states exist in the chimpanzee and various stresses such as diet, confinement, transportation, seasonal change, as well as pregnancy and lactation may cause a lowering of resistance resulting in illness.

4. The anaerobic flora of the chimpanzee can vary widely in its degree of anaerobiosis. The different sampling periods showed the percentage of obligate anaerobes to vary between 26% and 67%.

5. The types of anaerobes predominating in the chimpanzee include certain strains which have not been identified in man.

6. The anaerobes isolated from the lower dilutions of the fecal samples did not differ significantly either in type or degree of anaerobiosis from those anaerobes isolated in the top three dilutions.

7. Medications such as isoniazid and Delvix(R) influenced the types of anaerobes recovered from the feces.

8. Identification of the lactobacilli isolated from the fecal cultures of the chimpanzees were different than those isolated from the handlers. This is assumed to be of nutritional rather than phylogenetic origin.

9. The presence of microorganisms resembling M. tuberculosis in the feces of both animals and handlers might indicate transference.

10. Results of the tests for lipase production indicate that some of the fecal anaerobes, both obligate and facultative, are active in lipid metabolism.

RECOMMENDATIONS

1. The physiological studies begun under this contract should be extended in order to more fully delineate the function of those anaerobes predominating in the fecal flora of the chimpanzee.

2. All personnel handling the chimpanzees and all chimpanzees in the colony should be screened repeatedly for the presence of *Mycobacterium tuberculosis*.

3. Frequent screening of fecal cultures for the presence of potentially pathogenic members of the Enterobacteriaceae should be conducted to eliminate insofar as is possible the "carrier" state.

4. The fatty acid metabolism of the fecal anaerobes should be explored by biochemical and physiological means to obtain information concerning lipid catabolism and anabolism.

5. Implantation of selected fecal anaerobes (in gelatin capsules) into the colon of chimpanzees could be attempted to see if *in vivo* effects of the change of flora could be detected.

6. Those type cultures found only in the chimpanzee should be studied for antibiotic production with emphasis placed on their ability to inhibit potentially pathogenic members of the Enterobacteriaceae.

SECTION V

TABLES

TABLE 1. ANIMALS SAMPLED (BRIEF HISTORY)

Animal Name	Holloman Designation	RAC Designation	Group	History
Marty	196	CF-100	1	
Susan	202	CF-101		
Guy	197	CF-102		
Janet	187	CF-103		
Gigi	155	CF-104		
Lennie	199	CF-105		
Linus	217	CF-106		
Rosie	232	CF-107		
Hope	136	CF-108		
Pop	218	CF-109		
Van	149	CF-110		
Clayton	130	CF-111		
Shirley	116	CF-112		
Rufe	114	CF-113		
Zazsa	145	CF-114		
Roy	101	CF-115		
Billy	85	CF-116		
Howard	157	CF-117		
Annie	167	CF-118		
Possum	169	CF-120		
Freda	224	CF-119	2	Isolation unit
Dearl	226	CF-121		
Andy	225	CF-122		
Richie	231	CF-123		
Brian	229	CF-124		
Mimi	126	CF-141	3	Returned from Wisconsin, on Delvex
Marc	172	CF-125		
Denise	145	CF-126		
Sonia	122	CF-142		
Randy	170	CF-143		
Manuel	139	CF-146		
Elbys	117	CF-145		
Phil	174	CF-147		
Donald	198	CF-148		
Shorty	238	CF-140	4	From Phoenix
Meredith	235	CF-135		
Glory	237	CF-138		
Floyd	239	CF-134		
Mel	236	CF-137		
Bob	233	CF-139		

TABLE 1. -- Continued

Animal Name	Holloman Designation	RAC Designation	Group	History
Brian Richie Dearl Andy	229 231 226 225	CF-129 CF-131 CF-132 CF-130	5	TB isolation from September
Jerry Laveeta Clay Gromic	242 190 246 234	CF-144 CF-149 CF-133 CF-136	6	Received Holloman February 12
Chester Tina	245 244	CF-128 CF-127	7	Isolation 1 month or less in country
Kay Ike May Henry	258 255 257 256	CF-158 CF-159 CF-160 CF-161	8	From Tulane. In isolation
Francis Jaylen	259 260	CF-171 CF-172	9	CDC, Asiatic, Phoenix 3 months. Came into colony May 12.
Walter	169	CF-168	10	USC. Isolation.
Randy Red Marc Denise Mimi Sonia	170 158 172 145 126 122	CF-162 CF-163 CF-166 CF-167 CF-169 CF-174	11	Previously in group receiving Delvex.
Meredith Bab Glory Shorty Mel Floyd	235 233 237 238 236 239	CF-152 CF-153 CF-155 CF-156 CF-157 CF-170	12	Previously in Phoenix group.
Chester Gromic Clay Laveeta Jerry	245 234 246 190 243	CF-150 CF-151 CF-154 CF-164 CF-165	13	Previously in isolation group.
Herbie	194	CF-173	14	Holloman Colony.
Snoopy	272	C-14A	15	Arrived from CDC 7/22/65 Housed in isolation (TB input) Diet: pellets, fruit, isoniazid (no cocktail)

TABLE 1. -- Continued

Animal Name	Holloman Designation	RAC Designation	Group	History
Penny Kenny	275 276	C-6A C-7A	16	Arrived from University of Maryland 9/16/65. Housed in isolation. Normal diet of pellets, fruit and cocktail
Lorreine Lady Bird	273 274	C-10A C-11A	17	Arrived from CDC 8/13/65. Housed in isolation. Normal diet of pellets, fruit and cocktail.
Dearl Richie Andy Brian	226 231 225 229	C-8A C-9A C-12A C-13A	18	In colony at least 6 months. TB animals housed in isolation. Pellets, fruit, isoniazid. (no cocktail)
Winny Buddha Lucy	262 263 264	C-23A C-24A C-25A	19	In colony at least 6 months. Nutrition animals. Housed in front rooms 7/9 to 8/4. Fed Purina pellets only. 8/4 to 8/13 fed WARF pellets 8/13 to present Purina pellets only.
Sara Dick	261 110	C-2A C-15A	20	In colony at least 6 months. Used in comparative psychology program with deprivation of normal diet and Ciba pellets supplementation periodically.
Betty Cary Oscar	203 183 211	C-1A C-18A C-19A	21	In colony at least 6 months. Normal diet of pellets, fruit and cocktail up until 9/9/65 then placed on WARF pellets only until 9/27 then switched back to regular diet.
Fay Angie Pepe Karen Mandy Debbie	254 162 252 177 208 204	C-3A, 22A C-4A C-5A, 21A C-16A C-17A C-20A	22	In colony at least 6 months. Normal diet of pellets, fruit and cocktail

TABLE 1. -- Concluded

HANDLERS

Man 1	L. R. Boone
Man 2	B. J. Teal
Man 3	R. H. Vegl
Man 4	A. Taylor
Man 5	C. Barton
Man 6	L. R. Boone
Man 7	B. J. Teal
Man 8	R. H. Vegl
Man 9	A. Taylor
Man 10	C. Barton

TABLE 2. AEROBIC MICROORGANISMS FOUND IN NORMAL HUMAN FECES WITH COMPARISON TO THOSE FOUND IN THE CHIMPANZEE

	HUMAN			CHIMPANZEE	
	Literature(36)	NASw-738(37)	AF33(615)-1814(39) AF33(615)-1748(38)	AF29(600)-4124(1)	AF29(600)-4991
GRAM + COCCI					
Coagulase negative staph	+	+	+	+	+
Coagulase positive staph	+	+	+	+	+
Str. mitis	+	+	+	+	+
Str. salivarius	+	+	+	+	+
Enterococci	+	+	+	+	+
Str. pyogenes (BCFG)	+		+	+	+
GRAM + BACILLI					
Lactobacilli	+	+	+	+	+
Corynebacteria	+	+	+	+	+
Mycobacteria	+	**	**	**	+
Actinomyces bifidus	+		+		
GRAM - BACILLI					
Undifferentiated coliforms	+	+	+	+	+
E. coli	+	+	+	+	+
E. coli "intermediates"	+	+	+	+	+
Klebsiella	+	+	+	+	+
Proteus sp.	+	+	+	+	+
Pseudomonas aeruginosa	+	+	+	+	+
Alcaligenes faecalis	+		+	+	+
Vibrio alcaligenes	+	+	+	+	+
Serratia			+	+	+
Mima polymorpha	+			+	+
Aerobacter C and B			+	+	+
Citrobacter			+		+
PPLO	+	+	+	+	+
FUNGI					
Candida albicans	+		+	+	+
Other candidas	+		+	+	+

** Not tested for

TABLE 3. STREPTOCOCCUS FROM FECES

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Betty	203	C-1A		X	X		X					X	X			
Sara	261	C-2A	X				X									
Fay	254	C-3A	X	X	X							X				
Angie	162	C-4A	X	X	X		X			X		X				
Pepe	252	C-5A	X													
Penny	276	C-6A	X	X									X			
Kenny	275	C-7A		X												
Dearl	226	C-8A	X	X	X		X									
Richie	231	C-9A	X													
Lorreine	273	C-10A	X	X	X		X					X				
Lady Bird	274	C-11A		X	X		X									
Andy	225	C-12A			X		X					X				
Brian	229	C-13A	X		X											
Snoopy	272	C-14A	X	X	X		X					X				
Dick	110	C-15A	X		X		X			X		X				

TABLE 3 --- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Karen	177	C-16A	X													
Mandy	208	C-17A	X	X			X			X			X			
Cary	183	C-18A	X	X			X									
Oscar	211	C-19A	X	X			X									
Debbie	204	C-20A	X	X			X			X		X				
Pepe	252	C-21A		X	X					X						
Fay	254	C-22A		X	X					X						
Winny	262	C-23A		X	X		X					X				
Buddha	263	C-24A	X	X	X		X			X						
Lucy	264	C-25A		X	X		X			X						

TABLE 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Marty	196	100	X	X*	X		X									
Susan	202	101	X				X									
Guy	197	102	X	X*			X									
Janet	187	103	X	X*			X		C							
Gigi	155	104		X*			X									
Lennie	199	105	X	X*			X									
Linus	217	106	X				X									
Rosie	232	107	X				X									
Hope	136	108	X	X*			X									
Pop	218	109	X	X*			X									
Van	149	110	X	X*	X		X		C							
Clayton	130	111	X				X									
Shirley	116	112	X	X*			X									
Rufe	114	113	X													
Zazsa	143	114	X				X									

* Potentially Pathogenic

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Roy	101	115	X	X*			X									
Billy	85	116	X	X*	X		X									
Howard	157	117	X	X*			X									
Annie	167	118	X	X	X		X									
Freda	224	119	X	X*	X		X		C							
Possum	169	120	X	X*	X		X									X
Dearl	226	121	X	X*	X		X									X
Andy	225	122		X*			X									
Richie	231	123	X				X									X
Brian	229	124	X	X*			X									
Marc	192	125	X	X*			X									
Denise	145	126	X	X*			X									
Tina	244	127	X	X*												
Chester	245	128	X		X											
Brian	229	129	X				X									

* Potentially Pathogenic

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Andy	225	130					X									
Richie	231	131	X				X									
Dearl	226	132	X		X		X									
Clay	246	133	X	X*	X											
Floyd	239	134	X	X*	X		X									
Meredith	235	135	X		X											
Gromic	234	136	X	X*	X		X									
Mel	236	137	X		X		X									
Glory	237	138			X		X									
Bob	233	139			X		X									
Shorty	238	140	X		X		X									
Mimi	126	141	X	X*			X									
Sonia	122	142	X	X*			X									
Randy	170	143	X	X*			X									
Jerry	243	144			X		X									

* Potentially Pathogenic

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Elbys	117	145	X	X*			X									
Manuel	139	146	X	X*			X									
Phil	174	147	X	X*			X									
Donald	198	148	X				X									
Laveeta	190	149	X				X									
Chester	245	150	X	X*	X		X									
Gromic	234	151	X	X*			X									
Meredith	235	152		X*	X											
Bob	233	153		X*	X											
Clay	246	154		X*	X											
Glory	237	155	X	X*			X									
Shorty	238	156	X	X*	X		X									
Mel	236	157	X	X*	X		X								X	
Kay	258	158		X*			X									
Ike	255	159	X	X*			X									

* Potentially Pathogenic, Presumably Group F

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
May	257	160	X													
Henry	256	161	X		X											
Randy	170	162	X	X*			X									
Red	158	163	X	X*			X									
Laveeta	190	164	X		X		X									
Jerry	243	165	X		X		X									
Marc	172	166	X	X*			X									
Denise	145	167	X	X*			X									
Walter	169	168	X	X*												
Mimi	126	169		X*			X									
Floyd	239	170	X	X*	X		X									
Francis	259	171	X	X*	X											
Jaylen	260	172			X											
Herbie	194	173	X													
Sonia	122	174	X				X									

* Potentially Pathogenic, Presumably Group F

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Andy (c)	225	CF122		X*			X									
Andy (c)	225	CF130					X									
Andy (c)	225	C-12A			X		X					X				
Annie (a)	167	C-6			X											
Annie (c)	167	CF-118	X	X	X		X									
Betty (a)	203	C-22		X*	X		X									
Betty (a)	203	C-35		X*	X		X									
Betty (a)	203	C-43		X	X	X					X				X	
Betty (a)	203	C-61	X		X		X									
Betty (c)	203	C-1A		X	X		X					X	X			
Billy (a)	85	C-24			X	X	X		C							
Billy (a)	85	C-46		X*	X		X									

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (Quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Billy (a)	85	C-69		X*	X		X									
Billy (c)	85	CF-116	X	X*	X		X									
Bob (c)	233	CF139			X		X									
Bob (c)	233	CF153		X*	X											
Brian (c)	229	CF124	X	X*			X									
Brian (c)	229	CF129	X				X									
Brian (c)	229	C-13A	X		X											
Cary (a)	183	C-25			X		X		F							
Cary (a)	183	C-40	X	X*	X		X									
Cary (a)	183	C-45	X	X	X	X			C		X				X	
Cary (c)	183	C-18A	X	X			X									

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (Quarterly Reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Chester (c)	245	CF128	X		X											
Chester (c)	245	CF150	X	X*	X		X									
Clay (c)	246	CF133	X	X*	X											
Clay (c)	246	CF154		X*	X											
Dearl (c)	226	CF121	X	X*	X		X									X
Dearl (c)	226	CF132	X		X		X									
Dearl (c)	226	C-8A	X	X	X		X									
Debbie (a)	204	C-21	X		X		X		D							
Debbie (c)	204	C-20A	X	X			X			X		X				
Denise (b)	145	CW5			X	X	X		G							
Denise (b)	145	CW17	X	X*		X	X									

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Denise (b)	145	CW28	X		X		X									
Denise (b)	145	CW48	X		X		X									X
Denise (b)	145	CW49	X	X*			X									
Denise (b)	145	CW63	X	X	X		X		C							
Denise **	145	CW76	X				X		G							
Denise (b)	145	CW90	X	X*	X	X	X									
Denise (b)	145	CW102	X	X*	X		X									
Denise (b)	145	CW120		X*	X		X									
Denise (b)	145	CW122	X	X*			X									
Denise (b)	145	CW134	X	X*	X		X									
Denise (b)	145	CW146	X	X*			X									
Denise (b)	145	CW161	X	X*			X									
Denise (b)	145	CW169		X*	X		X									
Denise (a)	145	C-4			X	X										
Denise (a)	145	C-12		X*	X	X	X									

* Indicates possible pathogenicity ** Group B streptococcus

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Denise (c)	145	CF126	X	X*			X									
Denise (c)	145	CF167	X	X*			X									
Donald (b)	198	CW11			X		X									
Donald (b)	198	CW21	X	X	X		X									
Donald (b)	198	CW32	X		X	X	X									X
Donald (b)	198	CW42			X		X									X
Donald (b)	198	CW54		X												
Donald (b)	198	CW67	X	X*		X										
Donald (b)	198	CW77	X		X		X									
Donald (b)	198	CW94	X	X*			X									
Donald (b)	198	CW100	X	X*			X									
Donald (b)	198	CW114	X		X		X									
Donald (b)	198	CW130	X	X*	X		X									
Donald (b)	198	CW141	X				X									

* Indicates possible pathogenicity
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Donald (b)	198	CW150	X	X*	X		X									
Donald (b)	198	CW159	X				X									
Donald (b)	198	CW170					X									
Donald (c)	198	CF148	X				X									
Elbys (b)	117	CW9		X*	X		X	X	G							
Elbys (b)	117	CW24		X	X		X									
Elbys (b)	117	CW36					X									
Elbys (b)	117	CW44	X	X*	X											
Elbys (b)	117	CW59	X	X			X									
Elbys (b)	117	CW72	X	X*	X		X									
Elbys (b)	117	CW83	X		X		X									
Elbys (b)	117	CW95	X				X		C							
Elbys (b)	117	CW107			X		X									
Elbys (b)	117	CW115	X	X*	X											

* Indicates possible pathogenicity
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965.
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Elbys[b]	117	CW129		X*	X		X									
Elbys[b]	117	CW139	X	X*			X									
Elbys[b]	117	CW151	X	X*			X									
Elbys[b]	117	CW160	X	X*			X									
Elbys[b]	117	CW171		X*	X		X									
Elbys[c]	117	CF145	X	X*			X									
Fay[c]	254	C-3A	X	X	X							X				
Fay[c]	254	C-22A		X	X					X						
Floyd[c]	239	CF134	X	X*	X		X									
Floyd[c]	239	CF170	X	X*	X		X									
Gigi[a]	155	C-28	X	X*	X											
Gigi[c]	155	CF104		X*			X									

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Glory (c)	237	CF138			X		X									
Glory (c)	237	CF155	X	X*			X									
Gromic (c)	234	CF136	X	X*	X		X									
Gromic (c)	234	CF151	X	X*			X									
Guy (a)	197	C-31		X*	X											
Guy (a)	197	C-47			X	X	X								X	
Guy (a)	197	C-58	X	X*	X		X									
Guy (a)	197	CF102	X	X*			X									
Howard (a)	157	C-10		X*		X										
Howard (a)	157	CF117	X	X*			X									

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Janet (a)	187	C-30		X*	X											
Janet (a)	187	C-48			X	X	X								X	
Janet (a)	187	C-59	X				X									
Janet (c)	187	CF103	X	X			X		C							
Jerry (c)	243	CF144			X		X									
Jerry (c)	243	CF165	X		X		X									
Laveeta (c)	190	CF149	X				X									
Laveeta (c)	190	CF164	X		X		X									
Lennie (a)	199	C-33	X		X		X		A		X				X	
Lennie (a)	199	C-52		X	X	X	X								X	
Lennie (a)	199	C-56		X*	X		X									
Lennie (c)	199	CF-105	X	X*			X									

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Linnus (a)	217	C-65	X		X		X									
Linnus (c)	217	CF106	X				X									
Manuel (b)	139	CW12	X	X*	X											
Manuel (b)	139	CW23	X	X		X										
Manuel (b)	139	CW34			X		X									
Manuel (b)	139	CW43		X*	X		X									
Manuel **	139	CW58		X												
Manuel (b)	139	CW65	X			X										
Manuel (b)	139	CW84	X				X									
Manuel (b)	139	CW96	X		X		X									
Manuel (b)	139	CW108	X			X	X									
Manuel (b)	139	CW118	X	X*	X											
Manuel (b)	139	CW128	X	X*			X									
Manuel (b)	139	CW140	X				X									

* Indicates possible pathogenicity ** Strep - Group B

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Manuel (b)	139	CW152	X				X									
Manuel (b)	139	CW163	X				X									
Manuel (b)	139	CW173		X*	X		X									
Manuel (c)	139	CF146	X	X*			X									
Marc (b)	172	CW2			X		X	X							X	
Marc (b)	172	CW14	X	X	X	X	X		C							
Marc (b)	172	CW26			X		X									
Marc (b)	172	CW37		X*	X	X	X									
Marc (b)	172	CW56	X													X
Marc **	172	CW61	X				X		A							
Marc (b)	172	CW73	X	X*	X		X									
Marc (b)	172	CW88	X	X*			X		C							
Marc (b)	172	CW98	X	X*	X		X									
Marc (b)	172	CW111	X	X*	X											

* Indicates possible pathogenicity ** Group B streptococcus

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Marc (b)	172	CW121	X	X*	X											
Marc (b)	172	CW132	X	X*	X		X									
Marc (b)	172	CW143					X		C							Type B
Marc (b)	172	CW153			X											
Marc (b)	172	CW164	X	X*			X									
Marc (a)	172	C-19			X	X	X		A							
Marc (c)	172	CF125	X	X*			X									
Marc (c)	172	CF166	X	X*			X									
Marty (a)	196	C-67	X				X									
Marty (c)	196	CF100	X	X*	X		X									
Mel (c)	236	CF137	X		X		X									
Mel (c)	236	CF157	X	X*	X		X								X	

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1797-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Meredith (c)	235	CF135	X		X											
Meredith (c)	235	CF152		X*	X											
Mimi (b)	126	CW3	X	X*	X			X								
Mimi (b)	126	CW15		X*	X	X	X									
Mimi (b)	126	CW29	X		X		X									X
Mimi (b)	126	CW39		X*			X									
Mimi (b)	126	CW60	X													
Mimi (b)	126	CW71	X	X*	X		X									
Mimi (b)	126	CW81	X	X*	X	X	X									
Mimi (b)	126	CW85	X	X*			X									
Mimi (b)	126	CW105	X			X	X									
Mimi (b)	126	CW109	X	X*	X		X									
Mimi (b)	126	CW127	X	X*			X									
Mimi (b)	126	CW135	X	X*	X		X									

* Indicates possible pathogenicity

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29 (600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Mimi (b)	126	CW145	X						C							
Mimi (b)	126	CW158	X	X*	X		X									
Mimi (b)	126	CW167		X*			X		A							
Mimi (c)	126	CF141	X	X*			X									
Mimi (c)	126	CF169		X*			X									
Pepe (c)	252	C-5A	X													
Pepe (c)	252	C-21A		X	X					X						
Phil (b)	174	CW8		X*			X									
Phil (b)	174	CW22	X	X	X		X									
Phil (b)	174	CW35	X		X		X									X
Phil (b)	174	CW46	X	X			X									
Phil (b)	174	CW51	X	X*	X											
Phil (b)	174	CW69	X	X*												

* Indicates possible pathogenicity
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Phil (b)	174	CW80	X		X		X									
Phil (b)	174	CW91	X				X									
Phil (b)	174	CW104		X*	X		X									
Phil (b)	174	CW117	X		X		X									
Phil (b)	174	CW125	X	X*	X											
Phil (b)	174	CW137	X	X*	X		X									
Phil (b)	174	CW149	X	X*	X		X									
Phil (b)	174	CW155	X		X											
Phil (b)	174	CW174		X*	X		X									
Phil (a)	174	C-15		X*	X		X				X					
Phil (c)	174	CF147	X	X*			X									
Pop (a)	218	C-66	X	X*	X		X									
Pop (c)	218	CF109	X	X*			X									

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group *	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Possum (a)	169	C-2		X*												
Possum (a)	169	C-14		X*					C							
Possum (a)	169	C-64	X		X		X									
Possum (c)	169	CF120	X	X*	X		X									X
Randy (b)	170	CW1			X		X	X							X	
Randy (b)	170	CW13	X	X	X	X	X		C							
Randy (b)	170	CW25	X		X		X									X
Randy (b)	170	CW38			X		X									
Randy (b)	170	CW55	X		X	X	X									
Randy (b)	170	CW62	X						G							
Randy (b)	170	CW74	X	X*	X		X									
Randy (b)	170	CW87	X		X		X									
Randy (b)	170	CW97	X	X*	X		X									
Randy (b)	170	CW112	X		X				C							Type B

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Randy (b)	170	CW120a	X	X*	X											
Randy (b)	170	CW131	X		X											
Randy (b)	170	CW142			X		X		C							Type B
Randy (b)	170	CW154	X	X*	X											
Randy (b)	170	CW165	X	X*	X		X									
Randy (a)	170	C-3		X*			X									
Randy (a)	170	C-20		X*			X									
Randy (c)	170	CF143	X	X*			X									
Randy (c)	170	CF162	X	X*			X									
Red (b)	158	CW6	X	X*	X		X	X								
Red (b)	158	CW19	X	X	X											
Red (b)	158	CW27	X		X		X									X
Red (b)	158	CW47	X		X	X	X									X
Red (b)	158	CW50	X													

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Red [b]	158	CW64	X		X	X	X									
Red [b]	158	CW75	X				X									
Red [b]	158	CW89	X		X											
Red [b]	158	CW101	X	X*	X		X									
Red [b]	158	CW119	X		X		X									Type B
Red [b]	158	CW123	X	X*	X		X									
Red [b]	158	CW133	X	X*	X		X									
Red [b]	158	CW147		X*	X		X									
Red [b]	158	CW162	X	X*	X		X									
Red [b]	158	CW168	X	X*	X		X									
Red [a]	158	C-7		X*	X	X										
Red [a]	158	C-13			X		X		A							
Red [c]	158	CF163	X	X*			X									

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Richie (c)	231	CF123	X				X									X
Richie (c)	231	CF131	X				X									
Richie (c)	231	C-9A	X													
Shirley (a)	116	C-16		X	X		X									
Shirley (a)	116	C-41	X	X*			X									
Shirley (c)	116	CF112	X	X*			X									
Shorty (c)	238	CF140	X		X		X									
Shorty (c)	238	CF156	X	X*	X		X									
Sonia (b)	122	CW4		X*	X		X									
Sonia (b)	122	CW16	X	X*	X											
Sonia (b)	122	CW30	X		X		X									X
Sonia (b)	122	CW40			X		X									

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Continued

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Sonia (b)	122	CW57	X													
Sonia (b)	122	CW70	X	X*												
Sonia (b)	122	CW82	X	X*			X									
Sonia (b)	122	CW86	X	X*	X		X									
Sonia (b)	122	CW106	X		X		X									
Sonia (b)	122	CW110	X	X*			X									
Sonia (b)	122	CW126	X	X*	X		X									
Sonia (b)	122	CW136	X				X									
Sonia (b)	122	CW144	X		X		X									
Sonia (b)	122	CW157	X		X		X									
Sonia (b)	122	CW166	X				X									
Sonia (a)	122	C-8		X*	X											
Sonia (a)	122	C-11	X	X*	X											
Sonia (c)	122	CF142	X	X*			X									
Sonia (c)	122	CF174	X				X									

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 3 -- Concluded

Animal	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
Van (a)	149	C-5		X*		X										
Van (a)	149	C-63	X	X*		X										
Van (c)	149	CF110	X	X*	X		X		C							
Walter (a)	168	C-9		X*	X											
Walter (c)	168	CF168	X	X*												

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 4. STREPTOCOCCI (HANDLERS) FROM FECES

Handler	Holloman No.	RAC Number	Enterococci	Non-Types	Salivarius	Bovis	Mitis	Human C	Type	Lactic Group	Equinus	Veridans Group	Pyogenic Group	Species Unidentified	Group G	Mixed Strain
L. Boone		Man 1			X		X									
B. Teal		Man 2			X											
R. Vegl		Man 3	X													
A. Taylor		Man 4	X		X											
C. Barton		Man 5			X							X	X			
L. Boone		Man 6		X	X											
B. Teal		Man 7														
R. Vegl		Man 8		X	X											
A. Taylor		Man 9			X											
C. Barton		Man 10		X	X								X			

TABLE 5. OCCURRENCE OF CORYNEBACTERIUM

Name	Holloman Number	RAC Number	striatum	pseudodiptheriticum	xerosis	acnes	species
Pepe	252	C-5A			X		
Penny	276	C-6A				X	
Richie	231	C-9A			X		
Lorreine	276	C-10A				X	
Dick	110	C-15A		X		X	
Karen	177	C-16A	X		X		
Mandy	208	C-17A					X
Fay	254	C-22A			X		
L. R. Boone		M-1			X		
B. J. Teal		M-2			X		
R. H. Vegl		M-3			X	X	
L. R. Boone		M-6		X	X		
B. J. Teal		M-7			X		
A. Taylor		M-9			X		

TABLE 6. RECOVERY OF SPIROCHAETALES FROM DEEP BLOOD FLASKS

Spirillum was isolated from the following handler and animals:

Animal Name	Holloman Designation	RAC Designation
Betty	203	C-1A
Fay	254	C-3A
Lorreine	273	C-10A
Lady Bird	274	C-11A
Snoopy	272	C-14A
Cary	183	C-18A
Oscar	211	C-19A
Debbie	204	C-20A
Pepe	252	C-21A
Buddha	263	C-24A
Lucy	264	C-25A

<u>Handler</u>

A. Taylor Man 4

TABLE 7. OCCURRENCE OF PPLO

The following animals showed the occurrence of PPLO:

Animal Name	Holloman Designation	RAC Designation
Sara	261	C-2A
Fay	254	C-3A
Pepe	252	C-5A
Lady Bird	274	C-11A
Andy	225	C-12A
Snoopy	272	C-14A
Dick	110	C-15A
Karen	177	C-16A
Mandy	208	C-17A
Oscar	211	C-19A
Fay	254	C-22A
Winny	262	C-23A
Buddha	263	C-24A
Lucy	264	C-25A

TABLE 8. COMPARISON OF MISCELLANEOUS AEROBES RECOVERED FROM FECES

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Andy (c)	225	CF122	X								X	X			
Andy (c)	225	CF130	X								X				
Andy (c)	225	C-12A					X				X	X	X		
Annie (a)	167	C-6	X						X			X			X
Annie (c)	167	CF118	X					X				X			
Betty (a)	203	C-22	X		X		X				X	X			
Betty (a)	203	C-35	X		X				X		can.	X			
Betty (a)	203	C-43	X				X		X		X	X			
Betty (a)	203	C-61													
Betty (c)	203	C-1A									X	X			

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Billy (a)	85	C-24			X		X		X		X	X			
Billy (a)	85	C-46	X*						X			X			
Billy (a)	85	C-69	X									X			
Billy (c)	85	CF116	X									X			
Bob (c)	233	CF139	X								X				
Bob (c)	233	CF153	X										X		
Brian (c)	229	CF124	X					X			X	X			
Brian (c)	229	CF129	X					X			X				
Brian (c)	229	C-13A									X	X			

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Cary [(a)]	183	C-25		X[B]							X	X				
Cary [(a)]	183	C-40	X	X			X	X	X			X				
Cary [(a)]	183	C-45	X				X		X			X	X			
Cary [(a)]	183	C-18A	X								X	X				
Chester [(c)]	245	CF128	X								X					
Chester [(c)]	245	CF150	X								X	X				X
Clay [(c)]	246	CF133	X*								X					
Clay [(c)]	246	CF154	X													X
Dearl [(c)]	226	CF121	X								X					
Dearl [(c)]	226	CF132	X								X					
Dearl [(c)]	226	C-8A									X	X				

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Debbie [a]	204	C-21	X						X		X				
Debbie [c]	204	C-20A										X			
Denise [b]	145	CW5	X						X						
Denise [b]	145	CW17										X			
Denise [b]	145	CW28										X			
Denise [b]	145	CW48									X				
Denise [b]	145	CW49						X			X	X			
Denise [b]	145	CW63									X	X			
Denise [b]	145	CW76	X								X	X			
Denise [b]	145	CW90	X								X	X			
Denise [b]	145	CW102	X									X			

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Denise (b)	145	CW120									X	X			
Denise (b)	145	CW122									X	X			
Denise (b)	145	CW134									X	X			
Denise (b)	145	CW146							X**		X	X			
Denise (b)	145	CW161							X**		X	X			
Denise (b)	145	CW169									X	X			
Denise (a)	145	C-4	X	X					X			X			X
Denise (a)	145	C-12	X					X				X			
Denise (c)	145	CF126	X									X			
Denise (c)	145	CF167	X*									X			
Donald (b)	198	CW11		X											X
Donald (b)	198	CW21									X	X			
Donald (b)	198	CW32									X				
Donald (b)	198	CW42									X				

* Indicates possible pathogenicity
** Beta Hemolytic Bacillus

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544(quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Donald (b)	198	CW54						X				X			
Donald (b)	198	CW67									X	X			
Donald (b)	198	CW77	X								X	X			
Donald (b)	198	CW94									X	X			
Donald (b)	198	CW100	X								X	X			
Donald (b)	198	CW114									X	X			
Donald (b)	198	CW130									X	X			
Donald (b)	198	CW141										X			
Donald (b)	198	CW150	X						X**		X	X			
Donald (b)	198	CW159	X						X**			X			
Donald (b)	198	CW170	X									X			
Donald (c)	198	CF148									X	X			
Elbys (b)	117	CW9	X				X		X		X	X			
Elbys (b)	117	CW24									X	X			

** Beta Hemolytic Bacillus

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Elbys (b)	117	CW36													
Elbys (b)	117	CW44	X*			X									
Elbys (b)	117	CW59	X								X	X			
Elbys (b)	117	CW72	X								X	X			
Elbys (b)	117	CW83	X*								X	X			
Elbys (b)	117	CW95	X					X				X			
Elbys (b)	117	CW107										X			
Elbys (b)	117	CW115	X								X	X			
Elbys (b)	117	CW129						X			X	X			
Elbys (b)	117	CW139	X					X			X	X			
Elbys (b)	117	CW151	X								X	X			
Elbys (b)	117	CW160	X						X**		X	X			
Elbys (b)	117	CW171	X*					X			X	X			
Elbys (c)	117	CF145	X								X	X			

* Indicates possible pathogenicity
** Beta Hemolytic Bacillus

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Fay (c)	254	C-3A					X				X	X	X			
Fay (c)	254	C-22Á					X	X			X	X				
Floyd (c)	239	CF134	X								X	X				
Floyd (c)	239	CF170	X									X				
Gigi (a)	155	C-28					X	X	X		X	X				
Gigi (c)	155	CF104	X									X				
Glory (c)	237	CF138	X								X	X				
Glory (c)	237	CF155	X								X					X
Gromic (c)	234	CF136	X*								X	X				
Gromic (c)	234	CF151	X								X		X			

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Guy (a)	197	C-31	X*				X					X			
Guy (a)	197	C-47	X								X	X			
Guy (a)	197	C-58													
Guy (c)	197	CF102	X									X			
Howard (a)	157	C-10									X	X			
Howard (c)	157	CF117	X								X	X			
Janet (a)	187	C-30	X*		X				X		X				
Janet (a)	187	C-48	X*				X		X			X			
Janet (a)	187	C-59	X												
Janet (c)	187	CF103	X									X			

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Jerry (c)	243	CF144	X								X					
Jerry (c)	243	CF165	X									X				X
Laveeta (c)	190	CF149	X									X				
Laveeta (c)	190	CF164	X*						X			X				X
Lennie (a)	199	C-33							X			X			X	
Lennie (a)	199	C-52	X*		X						X	X				
Lennie (a)	199	C-56	X*								X					
Lennie (c)	199	CF105	X									X				
Linnus (a)	217	C-65	X*													
Linnus (c)	217	CF106	X									X				

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Manuel (b)	139	CW12							X						X
Manuel (b)	139	CW23										X			
Manuel (b)	139	CW34	X*								X				
Manuel (b)	139	CW43	X*								X				
Manuel (b)	139	CW58	X								X	X			
Manuel (b)	139	CW65	X								X	X			
Manuel (b)	139	CW84	X								X	X			
Manuel (b)	139	CW96	X								X	X			
Manuel (b)	139	CW108	X									X			
Manuel (b)	139	CW118	X*					X			X	X			
Manuel (b)	139	CW128									X				
Manuel (b)	139	CW140									X	X			
Manuel (b)	139	CW152	X						X**		X	X			
Manuel (b)	139	CW162	X						X**			X			
Manuel (b)	139	CW173	X									X			
Manuel (c)	139	CF146	X								X	X			

* Indicates possible pathogenicity
** Beta Hemolytic Bacillus

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Marc [b]	172	CW143							X**		X	X				
Marc [b]	172	CW153	X						X**		X	X		X		
Marc [b]	172	CW164	X					X			X	X				
Marc [a]	172	C-19	X					X	X		X	X				
Marc [c]	172	CF125	X									X				
Marc [c]	172	CF166	X									X				
Marty [a]	196	C-67	X								X					
Marty [c]	196	CF100	X									X				
Mel [c]	236	CF137	X*								X	X				
Mel [c]	236	CF157	X								X	X				X

* Indicates possible pathogenicity ** Beta Hemolytic Bacillus

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Marc (b)	172	CW2	X				X				X				
Marc (b)	172	CW14	X								X	X			
Marc (b)	172	CW26										X			
Marc (b)	172	CW37	X								X	X			
Marc (b)	172	CW56	X								X				
Marc (b)	172	CW61									X	X			
Marc (b)	172	CW73	X								X	X			
Marc (b)	172	CW88	X									X			
Marc (b)	172	CW98	X*								X	X			
Marc (b)	172	CW111	X								X	X			
Marc (b)	172	CW121									X	X			
Marc (b)	172	CW132	X								X	X			

* Indicates possible pathogenicity

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Meredith (c)	235	CF135	X								X	X			
Meredith (c)	235	CF152	X								X				X
Mimi (b)	126	CW3	X		X		X		X		X				
Mimi (b)	126	CW15	X								X	X			
Mimi (b)	126	CW29	X								X				
Mimi (b)	126	CW39	X								X	X			
Mimi (b)	126	CW60	X								X	X			
Mimi (b)	126	CW71	X								X	X			
Mimi (b)	126	CW81	X*								X	X			
Mimi (b)	126	CW85	X*								X	X			
Mimi (b)	126	CW105	X					X			X				
Mimi (b)	126	CW109	X								X	X			
Mimi (b)	126	CW127						X			X	X			
Mimi (b)	126	CW135	X					X			X	X			

* Indicates possible pathogenicity

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Mimi (b)	126	CW145	X*						X**			X			
Mimi (b)	126	CW158	X						X**		X	X			
Mimi (b)	126	CW167	X					X			X	X			
Mimi (c)	126	CF141	X*									X			
Mimi (c)	126	CF169	X									X			
Oscar (a)	211	C-26	X												X
Oscar (a)	211	C-44	X*				X		X			X			
Oscar (c)	211	C-19A					X					X			
Pepe (c)	252	C-5A					X	X			X	X			
Pepe (c)	252	C-21A										X			

* Indicates possible pathogenicity

** Beta Hemolytic Bacillus

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Phil (b)	174	CW8	X				X		X		X	X			
Phil (b)	174	CW22	X									X			
Phil (b)	174	CW35									X				
Phil (b)	174	CW46	X								X	X			
Phil (b)	174	CW51	X								X	X			
Phil (b)	174	CW69	X								X	X			
Phil (b)	174	CW80									X	X			
Phil (b)	174	CW91	X								X	X			
Phil (b)	174	CW104	X								X	X			
Phil (b)	174	CW117									X	X			
Phil (b)	174	CW125	X								X	X			
Phil (b)	174	CW137									X	X			
Phil (b)	174	CW149									X	X			
Phil (b)	174	CW155	X						X**		X	X			
Phil (b)	174	CW174	X*								X	X			

* Indicates possible pathogenicity

** Beta Hemolytic Bacillus

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Phil (a)	174	C-15	X*												
Phil (c)	174	CF147	X								X	X			
Pop (a)	218	C-66	X						X						
Pop (c)	218	CF109	X								X				
Possum (a)	169	C-2	X	X	X	X	X		X			X			X
Possum (a)	169	C-14	X				X				X	X			
Possum (a)	169	C-64									X	X			
Possum (c)	169	CF120	X								X	X			

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Randy (b)	170	CW1					X				X				
Randy (b)	170	CW13										X			
Randy (b)	170	CW25									X				
Randy (b)	170	CW38									X	X			
Randy (b)	170	CW55	X								X	X			
Randy (b)	170	CW62									X	X			
Randy (b)	170	CW74	X								X	X			
Randy (b)	170	CW87	X								X	X			
Randy (b)	170	CW97									X	X			
Randy (b)	170	CW112									X	X			
Randy (b)	170	CW120a									X	X			
Randy (b)	170	CW131									X	X			
Randy (b)	170	CW142									X	X			
Randy (b)	170	CW154	X*						X**		X	X	X		
Randy (b)	170	CW165						X			X	X			

* Indicates possible pathogenicity
** Beta Hemolytic Bacillus
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Randy (a)	170	C-3	X	X	X	X	X					X				
Randy (a)	170	C-20	X		X		X	X	X			X				
Randy (c)	170	CF143	X									X				
Randy (c)	170	CF162	X*								X	X				X
Red (b)	158	CW6	X		X		X		X						X	
Red (b)	158	CW19									X	X				
Red (b)	158	CW27									X					
Red (b)	158	CW47	X*								X					
Red (b)	158	CW50	X								X	X				
Red (b)	158	CW64	X								X	X				
Red (b)	158	CW75										X				
Red (b)	158	CW89	X*									X				
Red (b)	158	CW101	X									X				
Red (b)	158	CW119	X									X				

* Indicates possible pathogenicity

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Red (b)	158	CW123										X				
Red (b)	158	CW133										X				
Red (b)	158	CW147	X					X	X**		X	X				
Red (b)	158	CW162	X						X**			X				
Red (b)	158	CW168										X				
Red (a)	158	C-7	X						X			X			X	
Red (a)	158	C-13	X						X		X	X				
Red (c)	158	CF163	X									X				X
Richie (c)	231	CF123	X					X			X	X				
Richie (c)	231	CF131	X								X					
Richie (c)	231	C-9A		X				X				X				
Shirley (a)	116	C-16	X				X				X	X			X	
Shirley (a)	116	C-41	X				X		X		X	X				
Shirley (c)	116	CF112	X								X	X				

** Beta Hemolytic Bacillus

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Shorty (c)	238	CF140	X*								X					
Shorty (c)	238	CF156	X*													X
Sonia (b)	122	CW4						X	X		X					
Sonia (b)	122	CW16									X	X				
Sonia (b)	122	CW30									X					
Sonia (b)	122	CW40	X*								X	X				
Sonia (b)	122	CW57									X	X				
Sonia (b)	122	CW70									X	X				
Sonia (b)	122	CW82									X	X				
Sonia (b)	122	CW86										X				
Sonia (b)	122	CW106	X									X				
Sonia (b)	122	CW110									X	X				
Sonia (b)	122	CW126	X								X	X				
Sonia (b)	122	CW136										X				

* Indicates possible pathogenicity

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus Sp.
Sonia (b)	122	CW144	X						X**			X				
Sonia (b)	122	CW157	X						X**		X	X		X		
Sonia (b)	122	CW166	X					X			X	X				
Sonia (a)	122	C-8	X*		X	X	X	X	X	X		X				
Sonia (a)	122	C-11	X		X				X			X				
Sonia (c)	122	CF142	X								X	X				
Sonia (c)	122	CF174	X									X				X
Van (a)	149	C-5	X					X	X			X	X			
Van (a)	149	C-63	X						X			X				
Van (c)	149	CF110	X								X	X				
Walter (a)	168	C-9	X		X	X		X	X			X	X		X	
Walter (c)	168	CF168									X	X				

* Indicates possible pathogenicity ** Beta Hemolytic Bacillus

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees" AF29(600)-4991

Table 8 -- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Betty	203	C-1A									X	X			
Sara	261	C-2A		X			X					X			
Fay	254	C-3A					X				X	X	X		
Angie	162	C-4A		X							X	X	X		
Pepe	252	C-5A					X	X				X			
Penny	276	C-6A	X*					X				X			
Kenny	275	C-7A	X								X	X			
Dearl	226	C-8A									X	X			
Richie	231	C-9A		X				X				X			
Lorreine	273	C-10A	X					X			X	X			
Lady Bird	274	C-11A	X	X			X					X			
Andy	225	C-12A					X				X	X	X		

*Potentially pathogenic, mannitol salt positive

TABLE 8 --- Continued

Animal	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Brian	229	C-13A									X	X			
Snoopy	272	C-14A					X				X	X	X		X
Dick	110	C-15A					X	X			X	X			
Karen	177	C-16A	X				X	X				X			
Mandy	208	C-17A					X	X				X			
Cary	183	C-18A	X								X	X			
Oscar	211	C-19A					X					X			
Debbie	204	C-20A										X			
Pepe	252	C-21A										X			
Fay	254	C-22A					X	X			X	X			
Winny	262	C-23A					X					X			
Buddha	263	C-24A					X					X			
Lucy	264	C-25A		X			X								

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Marty	196	100	X									X			
Susan	202	101	X								X	X			
Guy	197	102	X									X			
Janet	187	103	X									X			
Gigi	155	104	X									X			
Lennie	199	105	X									X			
Linus	217	106	X									X			
Rosie	232	107	X								X	X			
Hope	136	108	X												
Pop	218	109	X								X				
Van	149	110	X								X	X			
Clayton	130	111	X								X	X			

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Shirley	116	112	X								X	X			
Rufe	114	113	X								X	X			
Zazsa	143	114	X								X	X			
Roy	101	115	X								X	X			
Billy	85	116	X									X			
Howard	157	117	X								X	X			
Annie	167	118	X					X				X			
Freda	224	119	X								X	X			
Possum	169	120	X								X	X			
Dearl	226	121	X								X				
Andy	225	122	X								X	X			
Richie	231	123	X					X			X	X			

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Brian	229	124	X					X			X	X			
Marc	192	125	X									X			
Denise	145	126	X									X			
Tina	244	127	X								X	X			
Chester	245	128	X								X				
Brian	229	129	X					X			X				
Andy	225	130	X								X				
Richie	231	131	X								X				
Dearl	226	132	X								X				
Clay	246	133	X*								X				
Floyd	239	134	X								X	X			
Meredith	235	135	X								X	X			

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
Gromic	234	136	X*								X	X			
Mel	236	137	X*								X	X			
Glory	237	138	X								X	X			
Bob	233	139	X								X				
Shorty	238	140	X*								X				
Mimi	126	141	X*									X			
Sonia	122	142	X								X	X			
Randy	170	143	X									X			
Jerry	243	144	X								X				
Elbys	117	145	X								X	X			
Manuel	139	146	X								X	X			
Phil	174	147	X								X	X			

* Potentially Pathogenic

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus sp.
May	257	160									X	X				
Henry	256	161	X*													
Randy	170	162	X*								X	X				X
Red	158	163	X									X				X
Laveeta	190	164	X*						X			X				X
Jerry	243	165	X									X				X
Marc	172	166	X									X				
Denise	145	167	X*									X				
Walter	169	168									X	X				
Mimi	126	169	X									X				
Floyd	239	170	X									X				
Francis	259	171	X*+													

* Potentially Pathogenic, Coagulase-Positive Staphylococcus

\+ 2 Coagulase-Negative Staphylococci also isolated

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus sp.
Donald	198	148									X	X				
Laveeta	190	149	X									X				
Chester	245	150	X								X	X				X
Gromic	234	151	X								X		X			
Meredith	235	152	X								X					X
Bob	233	153	X										X			
Clay	246	154	X													X
Glory	237	155	X								X					X
Shorty	238	156	X*													X
Mel	236	157	X								X	X				X
Kay	258	158	X*									X				
Ike	255	159	X*								X	X				X

* Potentially Pathogenic, Coagulase-Positive Staphylococcus

Table 8 -- Continued

Animal	Holloman No.	RAC Number CW	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria	Micrococcus sp.
Jaylen	260	172	X									X				
Herbie	194	173	X						X			X	X			
Sonia	122	174	X									X				X

TABLE 8 --- Concluded

Handler	Holloman No.	RAC Number	Staphylococcus	Haemophilus	Pneumococcus	Leptotrichia	PPLO	Corynebacteria	Gram Positive Rod	Vibrio	Fungi Media	Lactobacillus	Sarcina	Gaffkya	Neisseria
L. Boone		Man 1						X				X			
B. Teal		Man 2						X				X			
R. Vegl		Man 3	X					X				X			
A. Taylor		Man 4	X*	X				X				X			
C. Barton		Man 5										X			
L. Boone		Man 6	X					X							
B. Teal		Man 7						X				X			
R. Vegl		Man 8	X					X				X			
A. Taylor		Man 9		X								X			
C. Barton		Man 10	X									X			

* Potentially pathogenic, mannitol salt positive

TABLE 9. TYPES OF FUNGI ISOLATED

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Susan	202	CF101					X		
Clayton	130	CF111						X	
Shirley	116	CF112		X					
Zazsa	143	CF114		X					
Possum	169	CF120						X	
Dearl	226	CF121		X					
Andy	225	CF122		X	X				
Tina	244	CF127		X					
Chester	245	CF128		X					
Brian	229	CF129		X					
Andy	225	CF130		X					
Floyd	239	CF134		X					
Bob	233	CF139		X					
Chester	245	CF150		X					
Gromic	234	CF151	X						
Meredith	235	CF152		X					
Glory	237	CF155	X						
Mel	236	CF157	X						

Table 9 -- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicalis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Denise [b]	145	CW5							
Denise [b]	145	CW17							
Denise [b]	145	CW28							
Denise [b]	145	CW48						X	
Denise [b]	145	CW49							
Denise [b]	145	CW63						X	
Denise [b]	145	CW76			X				
Denise [b]	145	CW90						X	
Denise [b]	145	CW102							
Denise [b]	145	CW120					X		
Denise [b]	145	CW122					X		
Denise [b]	145	CW134							
Denise [b]	145	CW146					X		
Denise [b]	145	CW161	X						
Denise [b]	145	CW169							
Denise [c]	145	CF126							
Denise [c]	145	CF167							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Donald [b]	198	CW11					X		
Donald [b]	198	CW21				X			
Donald [b]	198	CW32				X			
Donald [b]	198	CW42					X		
Donald [b]	198	CW54							
Donald [b]	198	CW67			X				
Donald [b]	198	CW77					X		
Donald [b]	198	CW94					X		
Donald [b]	198	CW100						X	
Donald [b]	198	CW114		X					
Donald [b]	198	CW130					X		
Donald [b]	198	CW141							Graphium sp.
Donald [b]	198	CW150					X		
Donald [b]	198	CW159							
Donald [b]	198	CW170							
Donald [c]	198	CF148							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Elbys(b)	117	CW9							
Elbys(b)	117	CW24				X			
Elbys(b)	117	CW36							
Elbys(b)	117	CW44							
Elbys(b)	117	CW59					X		
Elbys(b)	117	CW72						X	
Elbys(b)	117	CW83					X		
Elbys(b)	117	CW95							
Elbys(b)	117	CW107							
Elbys(b)	117	CW115							
Elbys(b)	117	CW129					X		
Elbys(b)	117	CW139							Penicillium sp.
Elbys(b)	117	CW151					X		
Elbys(b)	117	CW160							Mold sp. Chromogenic (yellow)
Elbys(b)	117	CW171	X						
Elbys(c)	117	CF145							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicalis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Manuel(b)	139	CW12							
Manuel(b)	139	CW23							
Manuel(b)	139	CW34					X		
Manuel(b)	139	CW43				X			
Manuel(b)	139	CW58						X	
Manuel(b)	139	CW65			X				
Manuel(b)	139	CW84						X	
Manuel(b)	139	CW96				X			
Manuel(b)	139	CW108							
Manuel(b)	139	CW118					X		
Manuel(b)	139	CW128							
Manuel(b)	139	CW140							Sporotrichun sp.
Manuel(b)	139	CW152						X	
Manuel(b)	139	CW163							
Manuel(b)	139	CW173							
Manuel(c)	139	CF146							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicalis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Marc[b]	172	CW2			X				
Marc[b]	172	CW14							
Marc[b]	172	CW26							
Marc[b]	172	CW37				X			
Marc[b]	172	CW56					X		
Marc[b]	172	CW61					X		
Marc[b]	172	CW73			X				
Marc[b]	172	CW88							
Marc[b]	172	CW98					X		
Marc[b]	172	CW111					X		
Marc[b]	172	CW121					X		
Marc[b]	172	CW132							C. pseudotropicalis
Marc[b]	172	CW143							
Marc[b]	172	CW153							C. krusei
Marc[b]	172	CW164							
Marc[c]	172	CF125							
Marc[c]	172	CF166							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Mimi(b)	126	CW3				X			
Mimi(b)	126	CW15			X	X			
Mimi(b)	126	CW29					X		
Mimi(b)	126	CW39			X				
Mimi(b)	126	CW60					X		
Mimi(b)	126	CW71				X			
Mimi(b)	126	CW81					X		
Mimi(b)	126	CW85							
Mimi(b)	126	CW105				X			
Mimi(b)	126	CW109					X		
Mimi(b)	126	CW127							
Mimi(b)	126	CW135							
Mimi(b)	126	CW145							
Mimi(b)	126	CW158							
Mimi(b)	126	CW167	X						
Mimi(c)	126	CF141							
Mimi(c)	126	CF169							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9. --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicalis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Phil [(b)]	174	CW8					X	X*	Black mucoid
Phil [(b)]	174	CW22				X			
Phil [(b)]	174	CW35							
Phil [(b)]	174	CW46				X			
Phil [(b)]	174	CW51			X				
Phil [(b)]	174	CW69			X				
Phil [(b)]	174	CW80						X	
Phil [(b)]	174	CW91						X	
Phil [(b)]	174	CW104						X	
Phil [(b)]	174	CW117					X		
Phil [(b)]	174	CW125							
Phil [(b)]	174	CW137							
Phil [(b)]	174	CW149							
Phil [(b)]	174	CW155	X						
Phil [(b)]	174	CW174							
Phil [(c)]	174	CF147							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichospores sp.	Yeast	Miscellaneous
Sonia (b)	122	CW4			X				
Sonia (b)	122	CW16				X			
Sonia (b)	122	CW30				X			
Sonia (b)	122	CW40			X				
Sonia (b)	122	CW57					X		
Sonia (b)	122	CW70					X		
Sonia (b)	122	CW82				X			
Sonia (b)	122	CW86							
Sonia (b)	122	CW106							
Sonia (b)	122	CW110				X	X		
Sonia (b)	122	CW126							
Sonia (b)	122	CW136							
Sonia (b)	122	CW144				X			
Sonia (b)	122	CW157							C. pseudotropicalis Alternaria sp.
Sonia (b)	122	CW166							
Sonia (c)	122	CF142							
Sonia (c)	122	CF174							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Concluded

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Richie[c]	231	CF123							
Richie[c]	231	CF131							
Richie[c]	231	C-9A							
Shorty[c]	238	CF140							
Shorty[c]	238	CF156							

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Randy[b]	170	CN1			X			X*	*Black mucoid
Randy[b]	170	CN13							
Randy[b]	170	CN25							
Randy[b]	170	CN38				X			
Randy[b]	170	CN55			X				
Randy[b]	170	CN62						X	
Randy[b]	170	CN74			X		X		
Randy[b]	170	CN87						X	
Randy[b]	170	CN97					X		
Randy[b]	170	CN112		X					
Randy[b]	170	CN120a							
Randy[b]	170	CN131							C. pseudotropicalis
Randy[b]	170	CN142					X		
Randy[b]	170	CN154							Penicillium sp.
Randy[b]	170	CN165							
Randy[c]	170	CF143							
Randy[c]	170	CF162							[T. mentagraphytes var enterdigetale]

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Concluded

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Ike	255	CF159	X						
May	257	CF160	X						
Randy	170	CF162							T. mentagraphytes var. enterdigetale
Walter	169	CF168							Penicillium sp. Actinomyces sp.
Betty	203	C-1A	X						
Fay	254	C-3A		X					
Angie	162	C-4A	X						Penicillium sp.
Pepe	252	C-5A	X						
Kenny	275	C-7A							C. krusei
Dearl	226	C-8A		X					
Lorreine	273	C-10A	X						
Andy	225	C-12A						X	
Brian	229	C-13A						X	
Snoopy	272	C-14A	X						
Dick	110	C-15A	X						Penicillium sp.
Cary	183	C-18A						X	
Fay	254	C-22A		X					

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Red[b]	158	CW6							
Red[b]	158	CW19				X			
Red[b]	158	CW27				X			
Red[b]	158	CW47				X			
Red[b]	158	CW50					X		
Red[b]	158	CW64					X		
Red[b]	158	CW75							
Red[b]	158	CW89							
Red[b]	158	CW101							
Red[b]	158	CW119							
Red[b]	158	CW123							
Red[b]	158	CW133	X						
Red[b]	158	CW147					X		
Red[b]	158	CW162							
Red[b]	158	CW168							
Red[c]	158	CF163							

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicalis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Andy[(c)]	225	CF122			X				
Andy[(c)]	225	CF130		X					
Andy[(c)]	225	C-12A						X	
Bob[(c)]	233	CF139		X					
Bob[(c)]	233	CF153							
Brian[(c)]	229	CF124							
Brian[(c)]	229	CF129		X					
Brian[(c)]	229	C-13A						X	
Chester[(c)]	245	CF128		X					
Chester[(c)]	245	CF150		X					
Clay[(c)]	246	CF133							
Clay[(c)]	246	CF154							

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 9 --- Continued

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Dearl[c]	226	CF121		X					
Dearl[c]	226	CF132							
Dearl[c]	226	C-8A		X					
Fay[c]	254	C-3A		X					
Fay[c]	254	C-22A		X					
Floyd[c]	239	CF134		X					
Floyd[c]	239	CF170							
Glory[c]	237	CF138							
Glory[c]	237	CF155	X						
Gromic[c]	234	CF136							
Gromic[c]	234	CF151	X						

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 9 -- Concluded

Animal Name	Holloman Designation	RAC Designation	Candida sp.	C. albicans	C. tropicallis	Geotrichum candidum	Trichosporon sp.	Yeast	Miscellaneous
Jerry[c]	243	CF144							
Jerry[c]	243	CF165							
Laveeta[c]	190	CF149							
Laveeta[c]	190	CF164							
Mel[c]	236	CF137							
Mel[c]	236	CF157	X						
Meredith[c]	235	CF135							
Meredith[c]	235	CF152		X					
Pepe[c]	252	C-5A	X						
Pepe[c]	252	C-21A							

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

TABLE 10. COMPARISON OF GRAM NEGATIVE BACILLI RECOVERED FROM FECES

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Andy (c)	225	CF122	X			X									X				coli
Andy (c)	225	CF130					X	X											coli
Andy (c)	225	C-12A		B, C, H, LF **															
Annie (a)	167	C-6		X															Beta Hemolytic rod unidentified gm negative coli *
Annie (c)	167	CF118													X				coli
Betty (a)	203	C-22	X	X				X											coli Poly II
Betty (a)	203	C-35	X		X		X			X					X				coli
Betty (a)	203	C-43	X		X	X	X								X	X			
Betty (a)	203	C-61													X				
Betty (c)	203	C-1A																	

* Indicates possible pathogenicity
** See Table for pattern description

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanze[illegible]" AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Alkalenscens Dispar	Escherichia
Billy (a)	85	C-24														D X				coli Poly II
Billy (a)	85	C-46																		coli
Billy (a)	85	C-69											X		X					coli
Billy (c)	85	CF116																		coli
Bob (c)	233	CF139																		coli
Bob (c)	233	CF153													X				X**	coli
Brian (c)	229	CF124																		coli
Brian (c)	229	CF129			X										X					coli
Brian (c)	229	C-13A																		

Letters A-G indicate serotype

** Motile variety

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Cary (a)	183	C-25	X						X						A X				Poly I and II 0111: B4 coli Poly II 0125: B15 0128: B12
Cary (a)	183	C-40																	coli
Cary (a)	183	C-45					X												coli
Cary (c)	183	C-18A																	
Chester (c)	245	CF128				(d) X													coli
Chester (c)	245	CF150													X				coli
Clay (c)	246	CF133													X				coli
Clay (c)	246	CF154					X												coli
Dearl (c)	226	CF121													X		Poly + B		coli
Dearl (c)	226	CF132					X												coli
Dearl (c)	226	C-8A		F*															coli, no type

Letters A thru G indicate serotypes
+ = Alkalescens dispar
(d) Proteus sp
* See Table for pattern differentiation

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Debbie [a]	204	C-21		X			X						X						coli Poly I 055: B3
Debbie [c]	204	C-20A																	
Denise [b]	145	CW-5																	E. coli - B
Denise [b]	145	17		X															E. coli - no type
Denise [b]	145	28		X															E. coli
Denise [b]	145	48																	E. coli
Denise [b]	145	49																X	E. coli; 086:B7, 011:B4, 0124:B17, E. coli Poly A&B
Denise [b]	145	63																	E. coli Poly B086:B7 E. coli - no type
Denise [b]	145	76				X								X					E. coli - no type
Denise [b]	145	90				X									X				E. coli
Denise [b]	145	102				X													E. coli - no type
Denise [b]	145	120																	E. coli
Denise [b]	145	122																	E. coli
Denise [b]	145	134																	E. coli

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Denise (b)	145	CW-146																	E. coli; Bethesda-Ballerup
Denise (b)	145	161																	E. coli
Denise (b)	145	169		X															E. coli
Denise (a)	145	C-4																	E. coli; Aurescens
Denise (a)	145	C-12													X				coli
Denise (c)	145	CF126	X																coli
Denise (c)	145	CF167																	coli
Donald (b)	198	CW-11		X	X														E. coli - no type
Donald (b)	198	21											X		X				E. coli - no type
Donald (b)	198	32	X																
Donald (b)	198	42													X				
Donald (b)	198	54																	E. coli, Poly A&B 0127: B8 E. coli, Poly B 086: B7
Donald (b)	198	67																	E. coli; Poly B - no serotype E. coli Poly B, 086: B7
Donald (b)	198	77													X				

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Donald (b)	198	CW-94																X	
Donald (b)	198	100																	
Donald (b)	198	114																	E. coli; Arizona-Citrobacter
Donald (b)	198	130																	
Donald (b)	198	141																	
Donald (b)	198	150																	
Donald (b)	198	159																	
Donald (b)	198	170																	E. coli
Donald (c)	198	CF148								X									coli
Elbys (b)	117	CW-9			X										X		X		Poly B - no type
Elbys (b)	117	24																	E. coli - no type
Elbys (b)	117	36																	E. coli - Poly A
Elbys (b)	117	44																	E. coli
Elbys (b)	117	59																	E. coli, Poly B 086:B7

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Elbys (b)	117	CW-72				X												X	E. coli - no type E. coli, Poly B 086:B7
Elbys (b)	117	83																	E. coli
Elbys (b)	117	95		X															E. coli
Elbys (b)	117	107																	E. coli - no type
Elbys (b)	117	115																	E. coli; Poly B 0119:B14
Elbys (b)	117	129																	E. coli
Elbys (b)	117	139																	E. coli
Elbys (b)	117	151				X													E. coli
Elbys (b)	117	160																	E. coli
Elbys (b)	117	171																	E. coli
Elbys (c)	117	CF145																	coli

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus				Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
					morganii	vulgaris	mirabilis	rettgeri											
Fay [c]	254	C-3A																	coli, no type
Fay [c]	254	C-22A				X													coli, no type
Floyd [c]	239	CF134					X										Poly A X		coli
Floyd [c]	239	CF170				X												X	coli
Gigi [a]	155	C-28		X	X														coli
Gigi [c]	155	CF104					X								X				coli
Glory [c]	237	CF138					X								X				
Glory [c]	237	CF155					X								X			Vi X	coli
Gromic [c]	234	CF136													X				coli
Gromic [c]	234	CF151													X				coli

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Guy (a)	197	C-31														X			coli
Guy (a)	197	C-47	X												X				coli Poly A055:B5
Guy (a)	197	C-58																	
Guy (c)	197	CF102													X				coli
Howard (a)	157	C-10			X								X						* Unidentified beta hemolytic coli, gm negative rod
Howard (c)	157	CF117					X												coli
Janet (a)	187	C-30	X	X											X				coli
Janet (a)	187	C-48	X		X			X							X				coli Poly B 0124:B17, Poly B
Janet (a)	187	C-59																	coli Poly B
Janet (c)	187	CF103																	coli
Jerry (c)	243	CF144																	coli
Jerry (c)	243	CF165																	

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Laveeta [c]	190	CF149			X	X													
Laveeta [c]	190	CF164																	
Lennie [a]	199	C-33			X														coli Poly A, Poly B - no type
Lennie [a]	199	C-52																	coli
Lennie [a]	199	C-56																	
Lennie [a]	199	CF105													X			X	coli
Linnus [a]	217	C-65				X	X												coli Poly B 086:B7
Linnus [c]	217	CF106					X								X				

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Manuel (b)	139	CW12			X	X				X							X		E. coli, Poly B - no type
Manuel (b)	139	23			X	X													E. coli - no type
Manuel (b)	139	34				X	X												
Manuel (b)	139	43																	E. coli
Manuel (b)	139	58	X	X		X												X	
Manuel (b)	139	65																	
Manuel (b)	139	84																	E. coli
Manuel (b)	139	96		X		X												X	E. coli
Manuel (b)	139	108		X															E. coli; 0127:B8 - 0124:B17
Manuel (b)	139	118																X	E. coli; Arizona-Citrobacter
Manuel (b)	139	128																	E. coli
Manuel (b)	139	140																	E. coli; Poly A 011:B4; 0127:B8; Poly B 0126:B16
Manuel (b)	139	152				X				X									E. coli; Poly B 086:B7
Manuel (b)	139	163																	
Manuel (b)	139	173								X									E. coli
Manuel (c)	139	CF146				X				X									E. coli

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus				Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
					morganii	vulgaris	mirabilis	rettgeri											
Marc (b)	172	CW 2																	E. coli - no type
Marc (b)	172	14																	E. coli, Poly B 0128:B12 E. coli, Poly B 086:B7
Marc (b)	172	26																	E. coli
Marc (b)	172	37																	E. coli
Marc (b)	172	56																X	E. coli
Marc (b)	172	61																	
Marc (b)	172	73													X				E. coli - no type
Marc (b)	172	88																	E. coli
Marc (b)	172	98																	E. coli, Poly A&B 0126:B16, 111:B4; E. coli
Marc (b)	172	111													X				E. coli; Poly A&B
Marc (b)	172	121																	E. coli
Marc (b)	172	132													X				E. coli
Marc (b)	172	143																X	

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Marc [b]	172	CW153																	E. coli
Marc [b]	172	CW164																	E. coli
Marc [a]	172	C-19		X						X		X							coli Poly I & II 0127:B8 and 0128:B12
Marc [c]	172	CF125																	coli
Marc [c]	172	CF166																	coli
Marty [a]	196	C-67																	coli Poly B; coli
Marty [c]	196	CF100													X				coli
Mel [c]	236	CF137					X												coli
Mel [c]	236	CF157					X								X				
Meredith [c]	235	CF135					X												coli
Meredith [c]	235	CF152																	coli

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Anitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Mimi (b)	126	CW 3									X				X		X		E. coli B
Mimi (b)	126	15			X														E. coli - no type
Mimi (b)	126	29	X			X													E. coli
Mimi (b)	126	39													X				E. coli - Poly B E. coli - Poly B 0124:B17
Mimi (b)	126	60																	E. coli - no type
Mimi (b)	126	71	X												X			X	E. coli Poly B 086:B7
Mimi (b)	126	81				X													E. coli - no type
Mimi (b)	126	85		X		X	X											X	E. coli
Mimi (b)	126	105				X													
Mimi (b)	126	109													X			Poly O	E. coli; Arizona-Citrobacter
Mimi (b)	126	127											X						E. coli; Poly A0126:B16; Poly B 011:B4
Mimi (b)	126	135																	E. coli

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Mimi [b]	126	CW145				X													E. coli
Mimi [b]	126	CW158																	E. coli
Mimi [b]	126	CW167																	E. coli
Mimi [c]	126	CF141																	coli
Mimi [c]	126	CF169																	coli
Oscar [a]	211	C-26	X										X						coli
Oscar [a]	211	C-44	X																coli
Oscar [c]	211	C-19A																	
Pepe [c]	252	C-5A																	
Pepe [c]	252	C-21A																	

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus				Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
					morganii	vulgaris	mirabilis	rettgeri											
Phil (b)	174	CW 8																	
Phil (b)	174	22								X									
Phil (b)	174	35																	E. coli
Phil (b)	174	46	X																E. coli
Phil (b)	174	51																	E. coli; Poly B 086: B7
Phil (b)	174	69								X									
Phil (b)	174	80								X									E. coli 086: B7, E. coli - no type
Phil (b)	174	91													X				E. coli
Phil (b)	174	104		X															
Phil (b)	174	117																	E. coli
Phil (b)	174	125								X									E. coli
Phil (b)	174	137																	E. coli

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Phil (b)	174	CW149								X									
Phil (b)	174	CW155								X									
Phil (b)	174	CW174								X									E. coli
Phil (a)	174	C-15	X									X			X				coli coli Poly I - no type
Phil (c)	174	CF147								X									coli
Pop (a)	218	C-66																	coli Poly B
Pop (c)	218	CF109																	
Possum (a)	169	C-2		X	X		X			X	X				A X	X	X		coli
Possum (a)	169	C-14										X	X		C X				coli
Possum (a)	169	C-64				X				X									coli Poly B; coli
Possum (c)	169	CF120													X				coli

Letters A thru G indicate serotypes
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Randy (b)	170	CW 1		X			X								X	X			Poly B - no type
Randy (b)	170	13													X				E. coli - no type E. coli, Poly B - no further type
Randy (b)	170	25																	E. coli
Randy (b)	170	38		X											X				E. coli
Randy (b)	170	55	X																E. coli - no type
Randy (b)	170	62	X												X				E. coli - no type
Randy (b)	170	74	X	X											X				E. coli - no type
Randy (b)	170	87		X											X			X	E. coli
Randy (b)	170	97																	E. coli - no type
Randy (b)	170	112													X				E. coli
Randy (b)	170	120a																	E. coli
Randy (b)	170	131		X															E. coli
Randy (b)	170	142																	E. coli; Poly A 011:B4
Randy (b)	170	154																	
Randy (b)	170	165				X													E. coli

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Randy (a)	170	C-3													A, C X				coli Poly I 111: B4 aurescens
Randy (a)	170	C-20													X			C X	coli - no type
Randy (c)	170	CF143																	coli
Randy (c)	170	CF162								X									coli
Red (b)	158	CW 6													X				
Red (b)	158	19		X															E. coli; Poly B 0128: B12
Red (b)	158	27																	
Red (b)	158	47													X				
Red (b)	158	50	X																E. coli
Red (b)	158	64	X												X		X		
Red (b)	158	75																	E. coli - no type
Red (b)	158	89																	E. coli Poly A&B 111: B4; 0126: B16
Red (b)	158	101																	E. coli - no type
Red (b)	158	119																	

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Red (b)	158	CW123																	E. coli
Red (b)	158	133	X												X				E. coli
Red (b)	158	147																	E. coli; Bethesda-Ballerup
Red (b)	158	162																	E. coli
Red (b)	158	168																	E. coli
Red (a)	158	C-7	X								X	X							coli Poly I, coli - no type
Red (a)	158	C-13	X																coli Poly I, coli - no type
Red (c)	158	CF163																	coli
Richie (c)	231	CF123	X			X	X								X		Poly + B	X	coli
Richie (c)	231	CF131													X			X	coli
Richie (c)	231	C-9A		* D,B						X									

+ = alkalescens dispar * See Table for pattern description

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Alkalescens Dispar	Escherichia
Shirley [(a)]	116	C-16	X							X	X									Poly II 0128:B12
Shirley [(a)]	116	C-41	X															X		coli Poly B 0128:B12
Shirley [(c)]	116	CF112			X															coli
Shorty [(c)]	238	CF140																		coli
Shorty [(c)]	238	CF156		*** X															** X	coli
Sonia [(b)]	122	CW 4													X					
Sonia [(b)]	122	16		X						X										E. coli - no type
Sonia [(b)]	122	30					X													E. coli
Sonia [(b)]	122	40		X											X					E. coli
Sonia [(b)]	122	57					X													E. coli - no type
Sonia [(b)]	122	70	X												X					
Sonia [(b)]	122	82					X													E. coli
Sonia [(b)]	122	86		X											X					E. coli

** Motile variety *** alk/alk, cytrochrome oxidase negative

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Sonia [b]	122	CW-106		X											X			X	E. coli - no type
Sonia [b]	122	110													X			X	E. coli; Poly A; Arizone-Citrobacter
Sonia [b]	122	126			X														E. coli
Sonia [b]	122	136																	E. coli
Sonia [b]	122	144													X			X	
Sonia [b]	122	157																	E. coli
Sonia [b]	122	166	X	X											X			X	E. coli;Type A&B; Bethesda-Ballerup
Sonia [a]	122	C-8													C X				coli, Poly I&II 111:B4
Sonia [a]	122	C-11		X	X	X	X			X		X							coli, E. coli, Poly I 0111:B4, Poly II 0128:B12, 0126:B16
Sonia [c]	122	CF142				X													coli
Sonia [c]	122	CF174																	coli

Letters A-G indicate serotypes
(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Van [(a)]	149	C-5																	coli*, Poly I 0111:B4
Van [(a)]	149	C-63																	coli, Poly B 086:B7, Poly B
Van [(c)]	149	CF110													X				coli
Walter [(a)]	168	C-9										X			X				coli, Poly II 126:B16
Walter [(c)]	168	CF168				X		X										X	coli

* Indicates possible pathogenicity
(a) RAC 1095-5FR, "Study of Bacteria Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964
(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Betty	203	C-1A																	
Sara	261	C-2A																	
Fay	254	C-3A																	coli, no type
Angie	162	C-4A				X													
Pepe	252	C-5A																	
Penny	276	C-6A																	coli, no type
Kenny	275	C-7A																	
Dearl	226	C-8A		F*						X									coli, no type
Richie	231	C-9A		D*,B						X									
Lorreine	273	C-10A						X											coli, no type
Lady Bird	274	C-11A		G*															
Andy	225	C-12A		B,C, H,I,E															

* See Table 12 for pattern differentiation

TABLE 10 --- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Brian	229	C-13A																	
Snoopy	272	C-14A		E*						X									
Dick	110	C-15A																	coli, no type; coli, Poly A, 0111:B4 Poly B, no further type
Karen	177	C-16A																	coli, Poly A, 055:B5
Mandy	208	C-17A																	coli, no type
Cary	183	C-18A																	
Oscar	211	C-19A																	
Debbie	204	C-20A																	
Pepe	252	C-21A																	
Fay	254	C-22A				X													coli, no type
Winny	262	C-23A																	
Buddha	263	C-24A		J*															
Lucy	264	C-25A								X									

* See Table 12 for pattern differentiation

TABLE 10 --- Continued

Handlers	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Anitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
L. Boone		Man 1																	
B. Teal		Man 2																	coli, no type
R. Vegl		Man 3		G*											X				coli, no type
A. Taylor		Man 4		C*		X									X				coli, no type
C. Barton		Man 5																	
L. Boone		Man 6																	coli, no type
B. Teal		Man 7																	coli, no type
R. Vegl		Man 8																	coli, Poly B, no further type
A. Taylor		Man 9		K*											X				
C. Barton		Man 10																	

* See Table 12 for pattern differentiation

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Marty	196	100													X				Coli
Susan	202	101													X				Coli
Guy	197	102													X				Coli
Janet	187	103																	Coli
Gigi	155	104					X								X				Coli
Lennie	199	105													X			X	Coli
Linus	217	106					X								X				
Rosie	232	107			X														Coli
Hope	136	108				X	X												Coli
Pop	218	109																	
Van	149	110													X				Coli
Clayton	130	111																	Coli

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Shirley	116	112			X														Coli
Rufe	114	113				X													Coli
Zazsa	143	114													X				Coli
Roy	101	115																	Coli
Billy	85	116																	Coli
Howard	157	117					X												Coli
Annie	167	118													X				Coli
*Freda	224	119			X		X											X	Coli; Poly B
Possum	169	120													X				Coli
*Dearl	226	121													X		Poly +B		Coli
*Andy	225	122	X			X									X				Coli
*Richie	231	123	X			X	X								X		Poly +B	X	Coli
*Brian	229	124																	Coli

* Isolates; + = Alkaline Dispar

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Marc	192	125																	coli
Denise	145	126	X																coli
Tina	244	127					X												coli
Chester	245	128				X*													coli
Brian	229	129			X										X				coli
Andy	225	130					X	X											coli
Richie	231	131													X			X	coli
Dearl	226	132					X												coli
Clay	246	133													X				coli
Floyd	239	134					X										X**		coli
Meredith	235	135					X												coli
Gromic	234	136													X				coli
Mel	236	137					X												coli
Glory	237	138					X								X				
Bob	233	139																	coli

* Proteus sp.
** Poly A

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Escherichia
Shorty	238	140																	coli
Mimi	126	141																	coli
Sonia	122	142				X													coli
Randy	170	143																	coli
Jerry	243	144																	coli
Elbys	117	145																	coli
Manuel	139	146				X				X									coli
Phil	174	147								X									coli
Donald	198	148								X									coli
Laveeta	190	149			X	X													

Table 10 -- Continued

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Alkalenscens Dispar	Escherichia
Chester	245	150													X					coli
Gromic	234	151													X					coli
Meredith	235	152																		coli
Bob	233	153													X				X**	coli
Clay	246	154					X													coli
Glory	237	155					X								X			X*		coli
Shorty	238	156		X***															X**	coli
Mel	236	157					X								X					
Kay	258	158				X														coli
Ike	255	159								X					X					coli
May	257	160		X	X					X					X					coli
Henry	256	161			X										X					coli
Randy	170	162								X										coli
Red	158	163																		coli
Laveeta	190	164																		

* Vi
** Motile variety
*** Alk/Alk, Cytochrome oxidase negative

Table 10 -- Concluded

Animal	Holloman No.	RAC Number	Klebsiella	Unkeyed	Proteus morganii	Proteus vulgaris	Proteus mirabilis	Proteus rettgeri	Bacterium Antitratum	Pseudomonas	Alcaligenes	Moraxella-mima	Hafnia	Providence	Aerobacter	Serratia	Shigella	Salmonella	Alkalenscens Dispar	Escherichia
Jerry	243	165																		
Marc	172	166																		coli
Denise	145	167																		coli
Walter	169	168				X		X										X		coli
Mimi	126	169																		coli
Floyd	239	170				X												X		coli
Francis	259	171				X														coli
Jaylen	260	172			X	X														coli
Herbie	194	173			X										X		X*			
Sonia	122	174																		coli

* Poly B

TABLE 11. ENTEROPATHOGENIC STRAINS OF E. COLI ANTIGENS*

O (Somatic)	K (Sheath Envelope or Capsular)
26	B6
55	B5
86	B7
111	B4 (E. coli neapolitanum)
112	B11 (S. guanabara)
119	B14
124	B17
125	B15
126	B16
127	B8
128	B12

*Taken from "Clinical Diagnosis by Laboratory Methods," Edited by I. Davidshon and B. Wells, W. B. Saunders Company, Philadelphia, 1962, 13th Edition.

TABLE 12. PATTERN DIFFERENTIATION

Pattern	Indol	Methyl Red	Voges-Proskauer	Simmon's Citrate	Urease	Nitrate	Motility	TSI	Phenylalanine
A	+	+	+	+	-	+	-	a/a + gas	-
* B	+	+	-	+	-	+	+	a/H_2S	-
C	+	-	+	+	-	+	-	a/a + gas	-
D	+	±	+	+	-	+	+	a/a + gas	-
** E	+	+	-	+	-	+	+	a/H_2S + gas	+
F	+	+	+	+	-	+	+	a/a + gas	-
G	+	-	+	+	-	+	+	a/a + gas	-
H	+	+	-	-	-	+	-	a/H_2S + gas	-
I	+	+	-	-	-	+	+	a/H_2S + gas	-
J	+	-	+	+	+	+	-	a/a + gas	-
*** K	+	+	-	+	-	+	+	a/a + gas	+

* Indol + Citrobacter
** Proteus inconstans
*** Providence

TABLE 13

MYCOBACTERIA
(Ziehl-Nielson Identification of Cultures)

Animal Name	Holloman Designation	RAD Designation	Typical	Atypical	Absent
Betty	203	C-1		x	
Sara	261	C-2		x	
Fay	254	C-3		x	
Angie	162	C-4			x
Pepe	252	C-5	x		
Penny	276	C-6		x	
Kenny	275	C-7			x
Dearl	226	C-8			x
Richie	231	C-9	x	x	
Lorreine	273	C-10		x	
Lady Bird	274	C-11		x	
Andy	225	C-12		x	
Brian	229	C-13			x
Snoopy	272	C-14			x
Dick	110	C-15		x	
Karen	177	C-16		x	
Mandy	208	C-17		x	
Cary	183	C-18		x	
Oscar	211	C-19		x	
Debbie	204	C-20		x	
Pepe	252	C-21		x	
Fay	254	C-22		x	
Winnie	262	C-23		x	
Bhuddha	263	C-24		x	
Lucy	264	C-25		x	

Table 13 -- Concluded

Man Name	Man Number	Typical	Atypical	Absent
L. R. Boone	M 1		x	
B. J. Teal	M 2	x	x	
R. H. Vegl	M 3		x	
Andy Taylor	M 4	x		
C. Barton	M 5			x
L. R. Boone	M 6		x	
B. J. Teal	M 7	x		x
R. H. Vegl	M 8		x	
Andy Taylor	M 9	x		
C. Barton	M 10		x	

TABLE 14. LACTOBACILLI ISOLATED FROM ROGOSA'S PLATES

Animal	L. acidophilus & varieties	L. casei & varieties	L. fermenti & varieties	A-typical or unidentified	Present*	Non-transferrable**
C-1A			X		X	X
C-2A			X			
C-3A				X		
C-4A						X
C-5A	X					
C-6A						X
C-7A			X			
C-8A						X
C-9A						X
C-10A			X	X		X
C-11A				X		
C-12A						X
C-13A						X
C-14A						X
C-15A						X
C-16A			X			X
C-17A			X			
C-18A						X
C-19A			X			
C-20A			X			X
C-21A	X			X		X
C-22A			X			
C-23A						X
C-24A			X			
C-25A						X

* Lactobacilli present but not isolated in pure culture
** Organisms failed to grow in subculture from Rogosa's plates

TABLE 14 --- Concluded

Handler	L. acidophilus & varieties	L. casei & varieties	L. fermenti & varieties	A-typical or unidentified	Present[a]	Non-transferrable[b]
M-1						X
M-2		X	X			
M-3		X				X
M-4						X
M-5[c]						
M-6[c]						
M-7[c]						
M-8		X	X			X
M-9[c]						
M-10	X		X		X	X

(a) Lactobacilli present but not isolated in pure culture

(b) Organisms failed to grow in subculture from Rogosa's plates

(c) Rogosa's plate showed no growth

TABLE 15. GROWTH HEIGHT OF ANAEROBIC DILUTION TUBE AND COUNTS FROM AEROBIC COUNTING PLATE

Animal Name	Holloman Designation	RAC Designation	*Anaerobic Tube	**Aerobic Plate
Betty	203	C-1A	10	32
Sara	261	C-2A	8	tntc
Fay	254	C-3A	8	200
Angie	162	C-4A	8	600
Pepe	252	C-5A	8	0
Penny	276	C-6A	10	0
Kenny	275	C-7A	6	2
Dearl	226	C-8A	10	200
Richie	231	C-9A	10	3
Lorreine	273	C-10A	9	150
Lady Bird	274	C-11A	9	110
Andy	225	C-12A	8	200
Brian	229	C-13A	10	4
Snoopy	272	C-14A	7	62
Dick	110	C-15A	10	150
Karen	177	C-16A	10	236
Mandy	208	C-17A	10	42
Cary	183	C-18A	10	62
Oscar	211	C-19A	10	>500
Debbie	204	C-20A	10	116
Pepe	252	C-21A	7	4
Fay	254	C-22A	10	> 400
Winny	262	C-23A	7	> 200
Buddha	263	C-24A	6	125
Lucy	264	C-25A	7	105
Handler's Name				
L. R. Boone		Man 1	6	0
B. J. Teal		Man 2	9	6
R. H. Vegl		Man 3	9	8
A. Taylor		Man 4	10	210
C. Barton		Man 5	6	2
L. R. Boone		Man 6	6	0
B. J. Teal		Man 7	10	6
R. H. Vegl		Man 8	8	1
A. Taylor		Man 9	8	75
C. Barton		Man 10	7	1

* $7 = 10^9$ etc

** taken from 10^5

TABLE 16. DISTRIBUTION OF ANAEROBES IN FECAL SAMPLES FROM CHIMPANZEES

Anaerobes	Chimpanzee Number (C)													
	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A
FA-1														
FA-2														
FA-3														
FA-4						1					1		(1)	
FA-5										1			1	
FA-6														
FA-7														
FA-8				(1)	1		1	1						
FA-9			1			1								
FA-10														
FA-11														
FA-12					1									
FA-13		(1)												
FA-14								1						
FA-15														
FA-16			1											
FA-17														
FA-18	1													
GD-1		1												
GD-2				1										
GD-3				(1)	1	1								
GD-4		1												
GD-5			(1)	1		1								
GD-6	(1)								1					
GD-7														
CT-1		1								(1)				1
CT-2														
CT-3						(1)	1			1				
Unkeyed				1				1	2				1	1
TOTAL	2	4	3	5	3	5	2	3	3	3	1	0	3	2
FN-1	1						1					(1)		
FN-2	1												(1)	
FN-3														
FN-4		1	1			1								
FN-5		1												
Unkeyed								1						
Lactobacillus														
Enterococci										1				
CN-1			1						1		1	1	1	1
CN-2	1						1							
Miscellaneous														
TOTAL	3	2	2	0	0	1	2	1	1	1	1	2	2	1

() = Variation in pH

TABLE 16 --- Continued

Anaerobes	Chimpanzee Number (C)											
	15A	16A	17A	18A	19A	20A	21A	22A	23A	24A	25A	Total
FA-1												
FA-2												
FA-3												
FA-4												3
FA-5											1	3
FA-6								1				1
FA-7												
FA-8		1								1	1	7
FA-9		1				1						4
FA-10							1					1
FA-11												
FA-12												1
FA-13		1					1					3
FA-14												1
FA-15												
FA-16		1	1									3
FA-17												
FA-18						1						2
GD-1												1
GD-2									1			2
GD-3										1		4
GD-4												1
GD-5							1				(1)	5
GD-6							(1)	(1)		1	1	6
GD-7												
CT-1												3
CT-2							1	1				2
CT-3	1			1		1			1			7
Unkeyed	1						2*					9
TOTAL	2	4	1	1	0	3	7	3	2	3	4	69
FN-1												3
FN-2				1	1							4
FN-3									3			3
FN-4						1						4
FN-5												1
Unkeyed			4						1			6
Lactobacillus												
Enterococci									1	1		3
CN-1	1	2	1	1	2	1	1			1	1	17
CN-2										1		3
Miscellaneous												
TOTAL	1	2	5	2	3	2	1	0	5	3	1	44

*Unable to transfer

Table 16 -- Continued

Anaerobes	Pepe[(c)] 5A	21A	Pop 66[(a)]	109[(c)]	Possum[(a)] 2	14	64	120[(c)]	Richie[(c)] 123	131	9A
FA-1											
FA-2					1						
FA-3											
FA-4											
FA-5											
FA-6			1								
FA-7											
FA-8	1			1				1			
FA-9						1					
FA-10		1									
FA-11											
FA-12	1										
FA-13		1									
FA-14											
FA-15									1		
FA-16											
FA-17											
FA-18											
GD-1											
GD-2											
GD-3	1										
GD-4											
GD-5		1									
GD-6		(1)									1
GD-7											
CT-1											
CT-2		1									
CT-3											
Unkeyed		2*			2	2		1			2
TOTAL	3	7	1	1	3	3	0	2	1	0	3
FN-1											
FN-2										1	
FN-3											
FN-4											
FN-5											
Unkeyed					4				1**		
Lactobacillus			1								
Enterococci			3	8	1	1	3	8	5	6	
CN-1		1									1
CN-2											
Miscellaneous											
TOTAL	0	1	4	8	5	1	3	8	6	7	1

(1) variation in pH
* unable to transfer
** salivarius

Table 16 -- Continued

Anaerobes	Elbys (b)															
	9	24	36	44	59	72	83	95	107	115	129	139	151	160	171	145(c)
FA-1					1										1	
FA-2						4							2			
FA-3																
FA-4																
FA-5	1										1		1			
FA-6																
FA-7																
FA-8	1		1					1								
FA-9																
FA-10																
FA-11																
FA-12																
FA-13																
FA-14														1	1	
FA-15																1
FA-16																
FA-17								1								
FA-18													3			2
GD-1																
GD-2																
GD-3																
GD-4														1		
GD-5																
GD-6																
GD-7														1		
CT-1																
CT-2																
CT-3								1								
Unkeyed						1		1					1	2	1	
TOTAL	2	0	1	0	1	5	0	4	0	0	1	0	7	5	3	3
FN-1		1														
FN-2	1	1					1		2							
FN-3																
FN-4									1							
FN-5																
Unkeyed				1		1			2			1	1	1		
Lactobacillus	4	2	2	3	1			2	2	4	5	1	2	1	2	3
Enterococci	5			1	6	1	3	1		2		8			4	
CN-1																
CN-2																1
Miscellaneous																
TOTAL	10	4	2	5	7	2	4	3	7	6	5	10	3	2	6	4

Table 16 -- Continued

Anaerobes	Fay [c]		Floyd [c]		Gigi		Glory [c]	
	3A	22A	134	170	28 [a]	104 [c]	138	155
FA-1			1					2
FA-2			1					
FA-3								1
FA-4								
FA-5					1			
FA-6		1				1		
FA-7								
FA-8					2	2		
FA-9	1				1			
FA-10								
FA-11								
FA-12								
FA-13								
FA-14								1
FA-15				1				
FA-16	1							
FA-17								
FA-18			1					
GD-1								
GD-2								
GD-3								
GD-4								
GD-5	(1)							
GD-6		(1)						
GD-7				1				
CT-1								
CT-2		1						
CT-3								
Unkeyed						6		
TOTAL	3	3	3	2	4	9	0	4
FN-1					1			
FN-2								
FN-3								
FN-4	1							
FN-5								
Unkeyed					2			
Lactobacillus						1		
Enterococci			2	1			6	1
CN-1	1							
CN-2								
Miscellaneous								
TOTAL	2	0	2	1	3	1	6	1

(1) = Variation in pH

Table 16 -- Continued

Anaerobes	Gromic(c) 136	Gromic(c) 151	Guy(a) 31	Guy(a) 47	Guy(a) 58	Guy(a) 102(c)	Howard 10(a)	Howard 117(c)	Janet(a) 30	Janet(a) 48	Janet(a) 59	Janet(a) 103(c)
FA-1		3										
FA-2												
FA-3		2										
FA-4												
FA-5												
FA-6			2									
FA-7												
FA-8		1		2				1	2			
FA-9											1	
FA-10		1										
FA-11									1			
FA-12							1					
FA-13												
FA-14												
FA-15												
FA-16												
FA-17		1										
FA-18		1										
GD-1												
GD-2												
GD-3												
GD-4												
GD-5												
GD-6												
GD-7												
CT-1												
CT-2												
CT-3												
Unkeyed			1			1	2	2				
TOTAL	0	9	3	2	0	1	3	3	3	0	1	0
FN-1										2		
FN-2		1	1	2						1		
FN-3				1								
FN-4										1		
FN-5												
Unkeyed			1	4		1*				1		1*
Lactobacillus	1					1	1	1			1	
Enterococci	6	1		1	4	8		8		2	3	10
CN-1												
CN-2												
Miscellaneous												
TOTAL	7	2	2	8	4	10	1	9	0	7	4	11

* salivarius

Table 16 -- Continued

Anaerobes	Jerry[c]		Laveeta[c]		Lennie[a]				Linus	
	144	165	149	164	33	52	56	105[c]	65[a]	106[c]
FA-1		1	1						1	
FA-2										
FA-3		1					1			
FA-4										
FA-5										
FA-6						1				
FA-7										
FA-8						2				1
FA-9					1					
FA-10					2				1	
FA-11							1			
FA-12										
FA-13										
FA-14										
FA-15	2						1			1
FA-16										
FA-17	1									
FA-18		1								
GD-1										
GD-2										
GD-3										
GD-4										
GD-5										
GD-6										
GD-7										
CT-1					1					
CT-2						1				
CT-3										
Unkeyed					1		2			1
TOTAL	3	3	1	0	5	4	5	0	2	3
FN-1				1		1				
FN-2										
FN-3										
FN-4										
FN-5										
Unkeyed					1					
Lactobacillus				1		1			2	
Enterococci		3		2				6	1	6
CN-1										
CN-2										
Miscellaneous										
TOTAL	0	3	0	4	1	2	0	6	3	6

Table 16 -- Continued

Anaerobes	Manuel [(b)]															
	12	23	34	43	58	65	84	96	108	118	128	140	152	162	173	146[(c)]
FA-1														1		
FA-2																
FA-3																
FA-4																
FA-5													1			
FA-6				1												
FA-7						1										
FA-8	1															
FA-9																
FA-10																
FA-11																
FA-12																
FA-13																
FA-14																
FA-15								1	1							
FA-16																
FA-17						1										
FA-18																
GD-1																
GD-2																
GD-3																
GD-4																
GD-5																
GD-6																
GD-7																
CT-1			3	1												
CT-2		1														
CT-3														1		
Unkeyed	1									1			1	1		
TOTAL	2	1	3	2	0	2	0	1	1	1	0	0	2	3	0	0
FN-1											1					
FN-2	1	1				2	1	1			2					
FN-3								3								
FN-4	1	1														
FN-5																
Unkeyed	1						2							1		1
Lactobacillus	1			1				2	2				3		1	3
Enterococci	4	2		2	2	2	4			4	3	9			5	1
CN-1										1						
CN-2		1														1
Miscellaneous																
TOTAL	8	5	0	3	2	4	7	6	2	5	6	9	3	1	6	6

Table 16 -- Continued

Anaerobes	Marty		Mel (c)		Meredith (c)		Oscar (a)		
	67 (a)	100 (c)	137	157	135	152	26	44	19A (c)
FA-1		1				1			
FA-2									
FA-3						1			
FA-4									
FA-5									
FA-6									
FA-7									
FA-8						1			
FA-9									
FA-10									
FA-11									
FA-12									
FA-13									
FA-14									
FA-15		1							
FA-16									
FA-17									
FA-18						1			
GD-1									
GD-2									
GD-3				1		1			
GD-4									
GD-5									
GD-6									
GD-7									
CT-1									
CT-2									
CT-3									
Unkeyed								1	
TOTAL	0	2	0	1	0	5	0	1	0
FN-1									
FN-2									1
FN-3									
FN-4									
FN-5					1				
Unkeyed		1*					1	1	
Lactobacillus		1	3	1					
Enterococci	3	5	6		2		2	1	
CN-1									2
CN-2									
Miscellaneous					1**				
TOTAL	3	7	9	1	4	0	3	2	3

* salivarius

** veillonella

Table 16 -- Continued

Anaerobes	Sonia[b]																		
	4	16	30	40	57	70	82	86	106	110	126	136	144	157	166	8(a)	11(a)	142(c)	174(c)
FA-1														1					
FA-2	1																		
FA-3														1		2			
FA-4													1						
FA-5											1		1						
FA-6				1						2					1				
FA-7																	2		
FA-8	5							1							2		2		
FA-9																1			
FA-10									1							2			
FA-11																			
FA-12																			
FA-13																			
FA-14											2			1					
FA-15											1		1			2			
FA-16																			
FA-17						1													1
FA-18											2				1				1
GD-1													1						
GD-2															1				
GD-3																			
GD-4																			
GD-5																			
GD-6																			
GD-7																			
CT-1	1						1												
CT-2																			
CT-3																			
Unkeyed				1		1	1	1	1	1	4			1					
TOTAL	7	0	0	2	0	2	2	2	2	3	10	0	4	4	5	7	4	0	2
FN-1		2																	
FN-2		2				1	2										1		
FN-3			3															1	
FN-4																			
FN-5																			
Unkeyed						1	1							1		1		1	
Lactobacillus	3			3	1		1	1	3		1		2		1	2		2	2
Enterococci		3			2	3						7	1	1				1	1
CN-1											1							1	
CN-2															3				1
Miscellaneous																			
TOTAL	3	7	3	3	3	5	4	1	3	0	2	7	3	2	4	3	1	6	4

Table 16 -- Continued

Anaerobes	Mimi(b) 3	15	29	39	60	71	81	85	105	109	127	135	145	158	167	141(c)	169(c)
FA-1																	
FA-2	2																
FA-3					2	2											
FA-4																	
FA-5	1									2		1					
FA-6																	1
FA-7						1							1				
FA-8	3					1	1								1		
FA-9																	
FA-10																	
FA-11																	
FA-12						1							1				
FA-13																	
FA-14		1															
FA-15																	
FA-16											1						
FA-17													2	1			
FA-18															1	1	
GD-1																	
GD-2																	
GD-3																	
GD-4																	
GD-5																	
GD-6																	
GD-7																	
CT-1																	
CT-2		1			1												
CT-3																	
Unkeyed	1	4							1		2	1		1	1		1
TOTAL	7	6	0	0	3	5	0	1	1	2	3	2	4	2	3	1	2
FN-1		4														1	
FN-2				1												2	
FN-3			3														
FN-4																	
FN-5															1		
Unkeyed		1		1			4						2	1			
Lactobacillus					2	2		5	3		2	1	1		3	6	4
Enterococci		1		1	3	3						3			1		2
CN-1											3	1					
CN-2									1		1						
Miscellaneous																	
TOTAL	0	6	3	3	5	5	4	5	4	0	6	5	3	1	5	9	6

Table 16 -- Continued

Anaerobes	Phil (b) 8	22	35	46	51	69	80	91	104	117	125	137	149	155	174	15(a)	147(c)
FA-1					1								2	1			
FA-2				1		1			1								
FA-3						1	1										
FA-4																	
FA-5											1		1				
FA-6				2		2		1							1		
FA-7																	
FA-8	1				1						1						
FA-9														1		1	
FA-10		1											1		1	1	1
FA-11														1			
FA-12																	
FA-13																	
FA-14			1								1						
FA-15					1			1					1	1			
FA-16																	
FA-17																	1
FA-18												1			1		1
GD-1																	
GD-2																	
GD-3																	
GD-4																	
GD-5																	
GD-6																	
GD-7														1			
CT-1				1													
CT-2											1						
CT-3				1								1					
Unkeyed		3	1			1		2			1		1				
TOTAL	1	4	2	5	3	5	1	4	1	0	5	2	6	5	3	2	3
FN-1																2	
FN-2			1												2		
FN-3										1							
FN-4	2	1															
FN-5													1				
Unkeyed		4				1	1	2		1			1		1	2	
Lactobacillus	2		3			1		2	4		1		1				1
Enterococci					1							7			3		3
CN-1																	
CN-2						1											
Miscellaneous																	
TOTAL	4	5	4	0	1	3	1	4	4	2	1	7	3	0	6	4	4

Table 16 -- Continued

Anaerobes	Randy[b] 1	13	25	38	55	62	74	87	97	112	120(a)	131	142	154	165	3(a)	20(a)	143(c)	164(c)
FA-1											1								
FA-2																			
FA-3														1			4		
FA-4																1			
FA-5						1							2						1
FA-6													1						
FA-7																			
FA-8	1	1			2														1
FA-9																			
FA-10																			
FA-11								1											
FA-12																	1		
FA-13																			
FA-14													2						
FA-15													1					1	
FA-16																			
FA-17																			
FA-18														1					
GD-1																			
GD-2																			
GD-3																			
GD-4																			
GD-5																			
GD-6																			
GD-7																			
CT-1																			
CT-2																	2		
CT-3																			
Unkeyed	1	1				1			1			3	1	3			1		
TOTAL	2	2	0	0	2	2	0	1	1	0	1	3	7	5	0	1	8	1	2
FN-1		1		1						1									
FN-2			2	1		1											1		
FN-3	3																		
FN-4																1			
FN-5																			
Unkeyed	1		1			1			3								1	2	
Lactobacillus	1	1		1		1	1		1	1		2	1		4	1			
Enterococci	2	1		4	2	3	6	2	3		6	5			1				1
CN-1												1							
CN-2						1													
Miscellaneous																			
TOTAL	4	6	3	7	2	7	7	2	7	2	6	8	1	0	5	2	2	2	1

TABLE 16--- Continued

Anaerobes	Handler Number 1	2	3	4	5	6	7	8	9	10	Total
FA-1											
FA-2					1						1
FA-3											
FA-4	1				1						2
FA-5	1										1
FA-6											
FA-7								1			1
FA-8		1	1	2(1)			1		1	1	8
FA-9											
FA-10					1						1
FA-11						1					1
FA-12		1		1				1			3
FA-13											
FA-14				1							1
FA-15	1	1				1					3
FA-16		1									1
FA-17											
FA-18											
GD-1											
GD-2											
GD-3											
GD-4				1							1
GD-5											
GD-6											
GD-7	1	1				1					3
CT-1											
CT-2											
CT-3											
Unkeyed			3*	1			2*	2*	2*	2*	12
TOTAL	4	5	4	7	3	3	3	4	3	3	39
FN-1											
FN-2											
FN-3											
FN-4											
FN-5											
Unkeyed					1			1			2
Lactobacillus											
Enterococci											
CN-1	1		1								2
CN-2											
Miscellaneous											
TOTAL	1	0	1	0	1	0	0	1	0	0	4

* Unable to transfer
( ) Variation in pH

Table 16 -- Continued

Anaerobes	Shirley[a]			Shorty[c]		Van[a]			Walter	
	16	41	112[c]	140	156	5	63	110[c]	9[a]	168[c]
FA-1			1							1
FA-2										
FA-3							1		1	1
FA-4									7	
FA-5										1
FA-6										
FA-7										
FA-8								1		
FA-9					1					
FA-10										
FA-11						1				
FA-12										
FA-13										
FA-14				1					1	
FA-15			4	1						
FA-16										
FA-17										
FA-18			1							1
GD-1										
GD-2										
GD-3				2						
GD-4										
GD-5										
GD-6										
GD-7										
CT-1										
CT-2										
CT-3										
Unkeyed		1	3			1	1			
TOTAL	0	1	9	4	1	2	2	1	9	4
FN-1									2	
FN-2	2	4						1		
FN-3	1									
FN-4	1									
FN-5										
Unkeyed	2		1*			3		1**	1	
Lactobacillus			2					2		1
Enterococci	1		1	2		2	1	4		2
CN-1										
CN-2										
Miscellaneous										
TOTAL	7	4	4	2	0	5	1	8	3	3

* salivarius

** veillonella

Table 16 -- Continued

Anaerobes	Red(b)																
	6	19	27	47	50	64	75	89	101	119	123	133	147	162	168	7(a)	13(a)	163(c)
FA-1			3		1	1						2			1			
FA-2							1										1	
FA-3											1							
FA-4																	1	
FA-5			1															
FA-6			1		1												2	
FA-7																	1	
FA-8	4			1													1	
FA-9						1												
FA-10																		
FA-11													1					
FA-12																		
FA-13																		
FA-14														1			1	
FA-15					1						1							
FA-16																		
FA-17											2	2						
FA-18												1		1				
GD-1																		
GD-2															1			
GD-3																		
GD-4																		
GD-5																		
GD-6																		
GD-7																		
CT-1																		
CT-2																		
CT-3																		
Unkeyed	2							1						2				1
TOTAL	6	0	5	1	3	2	1	1	0	0	4	5	1	4	2	0	7	1
FN-1		4									1				1			
FN-2	1	3		1	2		1	2										
FN-3																		
FN-4													1				2	
FN-5															2			
Unkeyed				2										2				
Lactobacillus									2					4	1			
Enterococci	2		1	1	1	3	8	5	3	4	5	7				5		3
CN-1																		
CN-2																		
Miscellaneous																		
TOTAL	3	7	1	4	3	3	9	7	5	4	6	7	1	6	4	5	2	3

Table 16 -- Continued

Anaerobes	Marc(b) 2	14	26	37	56	61	73	88	98	111	121	132	143	153	164	19(a)	125(c)	166(c)
FA-1					1								2		2	1		
FA-2								2										
FA-3																		
FA-4									3									
FA-5						1												1
FA-6										1								1
FA-7																		
FA-8	3	2					1											
FA-9																1		
FA-10			1															
FA-11																		
FA-12																	1	
FA-13																		
FA-14							1											
FA-15											1							
FA-16																		
FA-17		2							2									
FA-18																		
GD-1																		
GD-2																		
GD-3																		
GD-4																		
GD-5																		
GD-6																		
GD-7																		
CT-1																1		
CT-2																		
CT-3																		
Unkeyed	2		2				2	2	1					1				
TOTAL	5	4	3	0	1	1	4	4	6	1	1	0	2	1	2	3	1	2
FN-1																1		
FN-2	1		1			2												
FN-3																		
FN-4		1																
FN-5													1					
Unkeyed							3	1					1					
Lactobacillus			1					1		1		1					3	1
Enterococci		1	2	5	3	3	2	1			11	10					2	2
CN-1												1						
CN-2															1			
Miscellaneous																		
TOTAL	1	2	4	5	3	5	5	3	0	1	11	12	2	0	1	1	5	3

Table 16 -- Continued

Anaerobes	Donald (b)															
	11	22	32	42	54	67	77	94	100	114	130	141	150	159	170	148 (c)
FA-1								1								
FA-2					1	3	1									
FA-3					1									1		
FA-4									2							
FA-5																
FA-6																
FA-7											2					
FA-8	2					1	1				1				1	
FA-9					1											
FA-10		1														1
FA-11																
FA-12																
FA-13																
FA-14																
FA-15													1			
FA-16																
FA-17									1							
FA-18											1			1		1
GD-1																
GD-2																
GD-3																
GD-4																
GD-5													1			
GD-6																
GD-7																
CT-1	1															
CT-2																
CT-3											1	1				
Unkeyed	1								1	1				4		
TOTAL	4	1	0	0	3	4	2	1	4	1	5	1	2	6	1	2
FN-1		1	1					1								
FN-2							1									
FN-3															1	
FN-4		3														
FN-5																
Unkeyed	3		1	1	1		2			1				2		
Lactobacillus	1			3				2	1		1	2	1		4	1
Enterococci	1				1	7	1	2		4	5	1				3
CN-1																
CN-2																
Miscellaneous																
TOTAL	5	4	2	4	2	7	4	5	1	5	6	3	1	2	5	4

Table 16 -- Continued

Anaerobes	Denise[(b)] 5	17	28	48	49	63	76	90	102	120	122	134	146	161	169	4(a)	12(a)	126(c)	167(c)
FA-1						2													1
FA-2	1										1								
FA-3						1													
FA-4																1			
FA-5																1			
FA-6		1											1				1		
FA-7																			
FA-8	2										1					1	1		1
FA-9		1																	
FA-10																		1	
FA-11																			
FA-12					1	1													
FA-13																			
FA-14													2	1					
FA-15					2														
FA-16																			
FA-17												1							
FA-18														1					
GD-1																			
GD-2																			
GD-3																			
GD-4																			
GD-5																			
GD-6																			
GD-7																			
CT-1																			
CT-2								1				1							
CT-3														1					
Unkeyed	1	2	1		1		1				1			1		1	1		
TOTAL	4	4	1	0	4	4	1	1	0	0	3	2	3	4	0	4	3	1	2
FN-1		3	1				1										2		
FN-2	1					1	2		1				1				1	1	
FN-3																			
FN-4																1		1	
FN-5																			
Unkeyed			1						2					1					
Lactobacillus	1	1						1				1	1	1	1	1	2	6	
Enterococci	1	1	2	3	2	3	4	2	2		6	5	3						2
CN-1															1				
CN-2															1				
Miscellaneous																			
TOTAL	3	5	4	3	2	4	7	3	5	0	6	6	5	2	3	2	5	8	2

Table 16 -- Continued

Anaerobes	Chester [c] 128	Chester [c] 150	Clay [c] 133	Clay [c] 154	Dearl [c] 121	Dearl [c] 132	Dearl [c] 8A	Debbie 21[a]	Debbie 20A[c]
FA-1				1					
FA-2									
FA-3				1				3	
FA-4									
FA-5									
FA-6									
FA-7									
FA-8		1			1		1		
FA-9						1			
FA-10								1	
FA-11									
FA-12									
FA-13									
FA-14				1			1		
FA-15		1		2					
FA-16									
FA-17		1							
FA-18	1	1							
GD-1									
GD-2									
GD-3		1							
GD-4									
GD-5									
GD-6									
GD-7									
CT-1									
CT-2									
CT-3			1						1
Unkeyed							1		
TOTAL	1	5	1	5	1	1	3	4	1
FN-1									
FN-2			1						
FN-3									
FN-4									1
FN-5									
Unkeyed	2		1				1		
Lactobacillus	1	1							
Enterococci	1		4		10	3			
CN-1									1
CN-2									
Miscellaneous									
TOTAL	4	1	6	0	10	3		0	2

Table 16 -- Continued

Anaerobes	Billy [a]				Bob [c]		Brian [c]			Cary [a]			
	24	46	69	116 [c]	139	153	124	129	13A	25	40	45	18A [c]
FA-1													
FA-2													
FA-3	2										3		
FA-4									1				
FA-5		1							1		1		
FA-6		1		1									
FA-7													
FA-8	1			1									
FA-9	1									1	2	1	
FA-10													
FA-11						1							
FA-12	1												
FA-13													
FA-14					1						1		
FA-15													
FA-16													
FA-17						1							
FA-18						1							
GD-1													
GD-2													
GD-3													
GD-4													
GD-5													
GD-6													
GD-7				1									
CT-1													
CT-2											1	1	
CT-3													
Unkeyed	1		1	1		1	1		1	1	1	1	
TOTAL	6	2	1	4	1	4	1	0	3	2	9	3	0
FN-1					1								
FN-2		1							1				1
FN-3													
FN-4												2	
FN-5													
Unkeyed		1						1				2	
Lactobacillus		2	1	4									
Enterococci			2	2	1		6	6		1		3	
CN-1									1				1
CN-2													
Miscellaneous								1*					
TOTAL	0	4	3	6	2	0	6	8	2	1	0	7	2

* Mixed

Table 16 -- Continued

Anaerobes	Andy (c) 122	130	12A	Annie 6(a)	118(c)	Betty(a) 22	35	43	61	C-1A(c)
FA-1										
FA-2										
FA-3										
FA-4										
FA-5				2						
FA-6							1			
FA-7										
FA-8	2							1		
FA-9										
FA-10										
FA-11										
FA-12										
FA-13										
FA-14										
FA-15					1					
FA-16										
FA-17										
FA-18										1
GD-1										
GD-2										
GD-3										
GD-4										
GD-5										
GD-6										1
GD-7										
CT-1										
CT-2										
CT-3										
Unkeyed	1			1	1					
TOTAL	3	0	0	3	2	0	1	1	0	2
FN-1			1			2	2	0		1
FN-2						1		5		1
FN-3										
FN-4								1		
FN-5					1					
Unkeyed				2			3			
Lactobacillus				2			2		2	
Enterococci	6	5		1	2	2			3	
CN-1			1							
CN-2					1					1
Miscellaneous										
TOTAL	6	5	2	5	4	5	7	6	5	3

(a) RAC 1095-5FR, "Study of Bacterial Flora of the Alimentary Tract of Chimpanzees," AF29(600)-4124, Dec. 1964

(b) RAC 1787-5FR, "The Influence of Diet on the Normal Fecal Flora of the Chimpanzee," AF29(600)-4555, May 1965

(c) RAC 2544 (quarterly reports), "Study of the Fecal Bacterial Population of Chimpanzees," AF29(600)-4991

Table 16 -- Continued

Anaerobes	Chimpanzee Number									
	100	101	102	103	104	105	106	107	108	109
FA-1	1	1								
FA-2										
FA-3										
FA-4										
FA-5										
FA-6					1					
FA-7										
FA-8		1			2		1	1		1
FA-9										
FA-10										
FA-11										
FA-12										
FA-13										
FA-14										
FA-15	1						1		1	
FA-16										
FA-17										
FA-18										
GD-1										
GD-2										
GD-3										
GD-4										
GD-5										
GD-6										
GD-7										
Unkeyed			1		6		1	1		
TOTAL	2	2	1	0	9	0	3	2	1	1
FN-1										
FN-2										
FN-3										
FN-4										
FN-5										
Unkeyed	1*		1*	1*						
Lactobacillus	1	1	1		1					
Enterococci	5	6	8	10		6	6	8	4	8
Miscellaneous										
TOTAL	7	7	10	11	1	6	6	8	4	8

FA & CT = Obligate Anaerobes
FN = Faculative Anaerobes
* Salivarius

Table 16 -- Continued

Anaerobes	Chimpanzee Number								
	110	111	112	113	115	116	117	118	120
FA-1			1						
FA-2				1					
FA-3									
FA-4									
FA-5									
FA-6						1			
FA-7									
FA-8	1	1				1	1		1
FA-9									
FA-10				1					
FA-11									
FA-12									
FA-13									
FA-14									
FA-15			4					1	
FA-16									
FA-17									
FA-18			1		2				
GD-1									
GD-2									
GD-3									
GD-4									
GD-5									
GD-6									
GD-7						1			
Unkeyed		2	3		2	1	2	1	1
TOTAL	1	3	9	2	4	4	3	2	2
FN-1									
FN-2	1								
FN-3									
FN-4									
FN-5								1	
Unkeyed	1*		(1)						
Lactobacillus	2	7	2	3		4	1		
Enterococci	4		1	2	2	2	8	2	8
Miscellaneous								1	
TOTAL	8	7	4	5	2	6	9	4	8

FA = Obligate Anaerobes
FN = Faculative Anaerobes

* Salivarius
(1) Pathogenic staph

Table 16 -- Concluded

Anaerobes	Chimpanzee										
	125	144	127	158	160	161	171	172	168	119	173
FA-1								1	1		
FA-2											
FA-3								1	1		
FA-4											
FA-5				1					1		
FA-6											
FA-7											
FA-8					2	2	1	1			
FA-9											
FA-10											1
FA-11											
FA-12	1										1
FA-13											
FA-14							1				
FA-15		2						1			1
FA-16											
FA-17		1						1			
FA-18						1			1	1	
GD-1											
GD-2											
GD-3											
GD-4											
GD-5											
GD-6											
GD-7											
Unkeyed										1	
TOTAL	1	3	0	1	2	3	2	5	4	2	3
FN-1											
FN-2											
FN-3											
FN-4											
FN-5											
Unkeyed										1	
Lactobacillus	3		1	3					1	1	1
Enterococci	2		1	1	1	1	2		2	8	1
Miscellaneous											
TOTAL	5	0	2	4	1	1	2	0	3	10	2

TABLE 17. DISTRIBUTION OF TYPE CULTURES IN COMPARATIVE CHIMPANZEE STUDIES ACCORDING TO OCCURRENCE

AF29(600)-4124[1]

Type Culture	Number Isolated
FA-8	50
FA-1	33
FA-2	25
FA-6	22
FA-17	22
FA-5	20
FA-15	19
FA-3	18
FA-14	15
FA-18	15
CT-1	10
FA-4	8
FA-10	7
CT-3	7
FA-12	6
CT-2	6
FA-7	5
FA-9	4
FA-11	3
FA-16	2
GD-2	2
GD-7	2
FA-13	1
GD-1	1
GD-4	1
GD-5	1
GD-3	0
GD-6	0

AF29(600)-4555[2]

Type Culture	Number Isolated
FA-8	42
FA-3	21
FA-6	14
FA-5	12
FA-4	11
CT-1	11
FA-14	10
FA-9	9
FA-1	8
FA-10	8
FA-7	6
FA-12	6
FA-2	5
FA-11	5
FA-13	4
CT-2	4
FA-15	3
FA-16	0
FA-17	0

AF29(600)-4991

Type Culture	Number Isolated
FN group	126*
FA-8	34
CT group	32*
CN-1	17
FA-1	16
FA-13	14
FA-18	20
FA-3	11
FA-17	9
GD-3	9
FA-5	7
FA-10	7
GD-6	7
CT-3	7
FA-9	6
FN-1	6
FA-6	5
FA-9	6
GD-5	5
FN-2	5
FN-4	5
FA-4	3
FA-12	3
FA-14	3
FA-16	3
FN-3	3
CN-2	3
CT-1	3

*These cultures from first field trip were not keyed as far as subsequent groups.

Table 17 -- Concluded

AF29(600)-4991 (cont'd)

Type Culture	Number Isolated
FA-2	2
GD-2	2
CT-2	2
FA-7	1
FA-11	1
GD-1	1

TABLE 18. DISTRIBUTION OF TYPE CULTURES
IN COMPARATIVE HUMAN STUDIES ACCORDING TO OCCURRENCE

NASw-738[37]		AF33(615)-1814[39]		NAS-9-4172[51]		AF29(600)-4991 Handlers Only	
Type Culture	Number Isolated	Type Culture	Number Isolated	Type Culture	Number Isolated	Type Culture	Number Isolated
FA-1	126	FA-15	206	FA-1	64	Unkeyed	12
FA-15	116	FA-3	111	FA-15	58	FA-8	8
FA-3	92	FA-18	76	FA-3	20	FA-12	3
FA-5	75	FA-12	74	FA-14	20	FA-15	3
FA-12	58	FA-1	66	FA-18	20	GD-7	3
FA-6	57	FA-14	56	GD-3	18	FA-4	2
FA-14	54	FA-5	54	FA-6	12	GN-1	2
FA-8	43	FA-17	53	FA-17	12	FA-2	1
FA-10	35	FA-9	49	FA-5	11	FA-5	1
FA-17	33	FA-8	43	FA-12	10	FA-7	1
FA-2	26	FA-6	40	FA-8	7	FA-10	1
FA-16	16	GD-6	38	FA-2	6	FA-11	1
FA-11	11	FA-10	37	GD-4	5	FA-14	1
FA-7	10	GD-3	23	GD-5	5	FA-16	1
FA-9	10	GD-1	22	FA-9	5	GD-4	1
FA-13	8	FA-2	15	FA-7	4		
FA-4	7	FA-16	14	FA-10	4		
		GD-5	13	GD-6	3		
		GD-2	12	FA-16	2		
		GD-7	12	GD-7	2		
		GD-4	11	FA-4	1		
		FA-4	8	FA-11	0		
		FA-13	8	GD-1	0		
		FA-11	7	GD-2	0		

TABLE 19. SCREEN TEST FOR PREDOMINATING OBLIGATE AND FACULTATIVE ANAEROBIC FECAL BACTERIA

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
FA-1	slender gram positive rod singly and in chains; distinct rods uniformly spaced	very fine colonies; very anaerobic	heavy turbidity with slime developing	4+ 4+ slimy sediment	4+ 4+ slimy sediment	4+ 4+ slimy sediment	2+ 2+ slight slime	+ 2+	delayed ARC* with proteolysis	no liquefaction	7.0
FA-2	slender gram positive rod in chains, with tadpole	diffuse colonies very anaerobic	heavy with slime	4+ with silky turbidity 4+ slime	3+ with silky turbidity 3+ slime	3+ with silky turbidity 3+ slime	± +	± ±	delayed ARC* with proteolysis	no liquefaction	6.4
FA-3	medium to small gram negative elongate pointed rods in pairs	diffuse growth; heavy gas; very anaerobic	heavy with slimy sediment	4+ slimy sediment 4+ black sediment	4+ slimy sediment 4+ black sediment	4+ slimy sediment 4+ black sediment	4+ slimy sediment 4+ black sediment	4+ slimy sediment 4+ black sediment	delayed ARC* with proteolysis and gas	no liquefaction	7.5
FA-4	slender gram positive, sometimes slightly curved rod, singly	small colonies; very anaerobic	moderate turbidity	4+ slime 4+ slime	4+ slime 4+ slime	4+ slime 4+ slime	2+ sediment 2+ sediment	2+ sediment 2+ sediment	ARC* strong delayed proteolysis	no liquefaction	5.6
FA-5	short, medium slightly curved gram positive rod, singly; often developing clusters	medium colonies, very anaerobic	moderate turbidity	4+ slime 4+ slime	4+ slime 4+ sediment	4+ slime 4+ sediment	4+ slime 4+ slime	± ±	delayed ARC* with proteolysis	no liquefaction	5.5-5.8
FA-6	gram positive medium rods, tending to form clusters some slightly curved	medium colonies, very anaerobic	clear slimy sediment	4+ slime 4+ slime	4+ slime 4+ slime	4+ slime 4+ slime	3+ slime 4+ slime	+ slight slime + slight slime	ARC*	no liquefaction	6.6

Results obtained under NASA contract NASw-738, "Study of the Normal Fecal Bacterial Flora of Man."

* Acid Reduced Curd

TABLE 19 --- Continued

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
FA-7	small gram negative slender rod, tendency towards bipolar staining	fine colonies; very anaerobic	moderate turbidity slime	4+ slime 4+ slime	4+ slime 4+ slime	4+ slime 4+ slime	+ + slime	+ +	ARC* delayed proteolysis	no liquefaction	6.6
FA-8	tiny gram negative slender rods, slightly curved	fine colonies; very anaerobic	clear with sediment	+ 3+	+ 3+	+ 3+	+ 3+	+ 3+	partial reduction orange color	no liquefaction	6.9
FA-9	medium to large pleomorphic gram positive rod in pairs and short chains; chain has characteristic hooked or loop shape - older cultures form heavy gram positive aggregation	haze; very anaerobic	moderate turbidity	3+ slight slime 3+ moderate slime	3+ slight slime 3+ moderate slime	+ slime 3+ slime	± slime + slight slime	clear with slight slime +	delayed ARC* with ± proteolysis	no liquefaction	7.0
FA-10	very small gram positive rods in chains with a tendency for bipolar staining, sometimes slightly pointed	fine colonies, very anaerobic	heavy with floccular sediment	4+ fluffy sediment 4+ sediment	4+ fluffy sediment 4+ sediment	4+ fluffy sediment 4+ sediment	3+ 4+ sediment	+ sediment 4+ sediment	delayed ARC* with proteolysis	no liquefaction	6.7
FA-11	medium short gram positive rods, some slightly curved, older cultures tend toward gram positive aggregation	fine colonies, very anaerobic	heavy turbidity	3+ 3+ sediment	3+ 3+ sediment	3+ sediment 3+ sediment	3+ 3+ sediment	± sediment clear with slight sediment	ARC* with proteolysis	no liquefaction	6.5
FA-12	gram positive tiny pointed rods in chains with many coccoid forms	medium colonies very anaerobic with slight gas	heavy with slime	3+ slime 3+ slime	3+ slime 3+ slime	+ with slime 3+ slime	± slime + slime	± slime ± slime	delayed ARC* with proteolysis	no liquefaction	7.2

TABLE 19 --- Continued

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
FA-13	small gram negative cocci in masses	fine colonies; heavy gas; very anaerobic	moderate turbidity	3+ gas black slime 3+ black slime	3+ gas black slime 3+ black slime	3+ gas black slime 3+ black slime	3+ gas black slime 3+ black slime	3+ gas black slime 3+ black slime	Reduced	no liquefaction	6.7
FA-14	gram negative rods, long slender with gram positive areas	tiny colonies, very anaerobic with heavy gas	heavy turbidity gas	4+ slight slime gas 4+	4+ slight slime 4+	+ 3+ sediment	± 3+ slime	± 3+slime	Reduced, whey carmelization	no liquefaction	6.75
FA-15	short fat gram negative rod, singly and in pairs; some with pointed ends	delayed haze; heavy gas; very anaerobic	heavy with slight slime	4+ slight slime 4+ slight slime	4+ slight slime 4+ slight slime	+ 4+ black slime	2+ slight slime 4+ slime	± ±	delayed ARC* with whey	no liquefaction grey sediment	6.7
FA-16	gram positive pleomorphic rods; some curved and some tadpole forms	haze with anaerobic collar	heavy with slime	+ curly slime 3+ slime	+ curly slime 3+ slime	+ curly slime 3+ slime	clear slime + slime	-	ARC*	no liquefaction	6.8
FA-17	large gram positive rod singly and in pairs forming palisades and V's	fine colonies very anaerobic, slight gas, occasionally	slight with finely granular sediment and side growth	clear with finely granular sediment clear with finely granular sediment	clear with finely granular sediment clear with finely granular sediment	clear with finely granular sediment clear with finely granular sediment	clear with finely granular sediment clear with finely granular sediment	clear with finely granular sediment clear with finely granular sediment	ARC* with	no liquefaction	6.6
FA-18	gram positive long slender rods, irregular staining	fine colonies; very anaerobic	slight with slime	± moderate slime ± moderate slime	± moderate slime ± moderate slime	± moderate slime ± moderate slime	± moderate slime ± moderate slime	± moderate slime ± moderate slime	ARC* delayed	no liquefaction	6.3 to 6.6

TABLE 19 --- Continued

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
FN-1	gram positive pointed rods in pairs and short chains	fine colonies facultative anaerobic	heavy with slime	4+ slime 4+ slime	4+ slime 4+ slime	3+ slime 4+ slime	3+ slime 4+ slime	3+ slime 4+ slime	delayed ARC*	no liquefaction	6.7
FN-2	gram positive coccobacillus pairs and chains	medium colonies facultative anae-robic	clear with growth on sides and white sediment	3+ granular sediment 3+ granular sediment	3+ granular sediment 3+ granular sediment	3+ granular sediment 3+ granular sediment	+ granular sediment 3+ granular sediment	± + with sediment	ARC* with	no liquefaction	6.5
FN-3	small round cocci in short chains becoming less discrete with age	discrete colonies with heavy gas facultative anae-robic	moderate with white sediment	3+ granular sediment 4+ granular sediment	3+ granular sediment 4+ granular sediment	4+ sediment 4+ granular sediment	3+ 3+ granular sediment	± ±	ARC* with proteolysis	no liquefaction	6.4
FN-4	gram positive elongate cocci in short chains	fine colonies facultative anae-robic	moderate	4+ slime 4+ slime	4+ slime 4+ slime	3+ slime 4+ slime	3+ slime 4+ slime	3+ slime 4+ slime	delayed soft ARC*	no liquefaction	6.5
FN-5	gram positive diplococci in pairs and short chains; pleomorphic	fine colonies; facultative anae-robic	moderate with floccular sediment	3+ floccular sediment 4+ floccular sediment	3+ floccular sediment 4+ floccular sediment	3+ floccular sediment 4+ floccular sediment	3+ floccular sediment 4+ floccular sediment	+ sediment + sediment	ARC* with slight proteolysis	no liquefaction	7.3 to 7.7

TABLE 19 --- Continued

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
GD-1	short gram negative rod in pairs and chains, some pointed	fine colonies, heavy gas, very anaerobic	heavy floccular sediment	4+ with slime	4+ with slime	4+ with slime	2+ with slime	1+ with slime	delayed ARC* with proteolysis	black bottom no liquefaction	6.7
				4+ with black slime	4+ with black slime	4+ with black slime	4+ with black slime	4+ with black slime			
GD-2	gram negative short rod in pairs	small colonies, very anaerobic	moderate with floccular slime	4+ with heavy slime	4+ with heavy slime	4+ with heavy slime	4+ with heavy slime	3+ with floccular slime	ARC* with proteolysis	no liquefaction	6.2 6.4
				3+ with heavy slime	3+ with heavy slime	3+ with heavy slime	3+ with heavy slime	+ slight floccular slime			
GD-3	gram negative pointed rods	tiny colonies, very anaerobic	moderate with moderate black sediment sometimes fluffy	2+ with slime	2+ with slime	2+ with slime	2+ with slime	2+ with slime	reduced	no liquefaction	6.8
				3+ with slime sometimes dark	3+ with slime sometimes dark	3+ with slime	3+ with slime	3+ with slime			
GD-4	gram negative slender rods in pairs some pleomorphic	tiny colonies heavy gas, very anaerobic	moderate with granular sediment, sometimes dark	4+ with slime and gas	4+ with slime and gas	4+ with slime and gas	4+ with slime and gas	3+ with slime and gas	delayed ARC* with slight proteolysis	no liquefaction	6.3 6.4
				4+ with slime sometimes dark	4+ with slime sometimes dark	4+ with slime sometimes dark	4+ with slime sometimes dark	3+ with slime sometime dark			

Results obtained under contract AF33(615)-1748, "Determination of Aerobic and Anaerobic Microflora of Human Feces."

TABLE 19 --- Continued

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
GD-5 and GD-5a	gram ± medium rods in short chains	small colonies, very anaerobic	clear to moderate with balls of sediment	4+ with granular sediment or slime	4+ with granular sediment or slime	4+ with granular sediment or slime	4+ with granular sediment or slime	2+ with granular sediment	ARC* with proteolysis	no liquefaction	6.6 GD-5a 6.2 to 6.4
				4+ with slime or granular sediment sometimes black	4+ with slime or granular sediment sometimes black	4+ with slime or granular sediment sometimes black	4+ with slime or granular sediment sometimes black	3+ with slime or granular sediment sometime black			
GD-6	gram negative short pleo-morphic rods in pairs some pointed	tiny colonies, heavy gas, very anaerobic	slight to moderate with slimy sediment	3+ with granular sediment	3+ with granular sediment	3+ with granular sediment	3+ with granular sediment	+ with slimy sediment	delayed ARC* with proteolysis	no liquefaction	5.9
				4+ with brown slime	4+ with brown slime	4+ with brown slime	4+ with brown slime	3+ with brown slime			
GD-7	gram ± short pleomorphic rods in pairs some pointed	tiny colonies, heavy gas, very anaerobic	4+ with dark slime	4+ with slime and heavy gas	4+ with slime and heavy gas	4+ with slime and heavy gas	3+ with heavy slime and gas	3+ with heavy slime and gas	reduced	no liquefaction black bottom	6.8
				4+ with heavy black slime	4+ with heavy black slime	4+ with heavy black slime	4+ with heavy black slime	4+ with heavy black slime			

TABLE 19 --- Continued

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
CT-1	tiny gram negative cocci in clusters	fine colonies with gas, very anaerobic	moderate with black granular sediment and gas	+ with dark granular sediment and gas	+ with dark granular sediment and gas	+ with dark granular sediment and gas	+ with dark granular sediment and gas	+ with dark granular sediment and gas	reduced with black bottom	no liquefaction black bottom and gas	7.5
				+ with dark granular sediment and side growth	+ with dark granular sediment and side growth	+ with dark granular sediment and side growth	+ with dark granular sediment and side growth	+ with dark granular sediment and side growth			
CT-2	gram positive large pointed rods in chains	small colonies heavy gas, very anaerobic	heavy with granular sediment	3+ with slime and side growth	3+ with slime and side growth	3+ with slime and side growth	+ with slime and side growth	+ with silky slime and side growth	ARC* with proteolysis and whey	no liquefaction	7.25
				3+ with slime and side growth	3+ with slime and side growth	3+ with slime and side growth	+ with slime and side growth	+ with silky slime and side growth			
CT-3	gram positive slender rods, some in chains, some slightly curved	very fine colonies; very anaerobic	heavy with slight gas	4+ with slime and gas	3+ with slime and gas	+ with slime	4+ with heavy slime	+ with slight slime	ARC* with delayed proteolysis	no liquefaction	5.6
				4+ with slime and gas	3+ with slime and gas	+ with slime	4+ with heavy slime	+ with slight slime			

Results obtained under Contract AF29(600)-4124, "Study of Bacterial Flora of Alimentary Tract of Chimpanzees."

TABLE 19 --- Concluded

Type Culture	Morphology	Agar Shake	Broth	Glucose	Sucrose	Lactose	Dextrin	Blank	Litmus Milk	Gelatin	pH
CN-1	gram positive rods, some slightly curved, some ovoid in chains	very fine colonies facultative anaerobic	slight with slime (dark?)	3+ with flocculant granules and side growth	3+ with flocculant granules and side growth	+ with slight slime	3+ with flocculant granules and side growth	+ with slight slime	ARC*	no liquefaction	5.8
				3+ with flocculant granules and side growth	3+ with flocculant granules and side growth	+ with slight slime	3+ with flocculant granules and side growth	+ with slight slime			
CN-2	gram positive rods some in pairs; various sizes	small colonies facultative anaerobic	slight with slime	1+ with granular slime	1+ with granular slime	1+ with granular slime	1+ with granular slime	1+ with granular slime	reduction	no liquefaction	7.3
				1+ with granular slime	1+ with granular slime	1+ with granular slime	1+ with granular slime	1+ with granular slime			

TABLE 20. LIPASE PRODUCTION

RAD CODE NO.	IDENTITY OF ORGANISM	LIPASE PRODUCTION
A 3	FA 18	+
A 10	FA 13	-
A 12	GD 4	-
A 14	CT 1	- Y*
A 19	FN 3	- Y*
A 28	GD 2	+
A 59	Unidentified	±
A 79	CN 1	+
A 150	GD 6	- Y*
A 236	FA 3	-
A 245	FA 16	+
A 249	Unidentified	+
A 254	FA 18	+
A 260	FA 10	-
A 261	FA 6	+
A 283	FA 11	-

* Y = yellow color in growth column

TABLE 21. EFFECT OF SELECTED FECAL ANAEROBES ISOLATED FROM THE CHIMPANZEES ON FATTY ACIDS*

Length of Incubation at Reading		6 - 7 Days	6 Days	6 - 7 Days	6 Days	3 - 4 Days	3 - 4 Days
Code Number	Identity of Organism	GTPn	GTB	GTS	GTO	GMR	CA
A 3	FA 18	+	±	±	-	-	-
A 10	FA 13	-	-	-	-	-	-
A 12	GD 4	-	-	-	-	-	-
A 14	CT 1	-	Y sl.	L	sl. L	-	-
A 19	FN 3	1 + 2 y	Y	L	L (sl.) (Y)	-	-
A 28	GD 2	±	+	-	-	-	-
A 59	Unidentified	-	-	-	-	-	-
A 79	CN 1	+	± sl.	-	-	-	-
A 150	GD 6	L, Y	Y	L	L	-	-
A 236	FA 3		-		-	-	-
A 245	FA 16		± sl.		-	-	-
A 249	Unidentified	±	-	-	1 + 2 -	-	-
A 254	FA 18	-	-	-	-	-	-
A 260	FA 10	1 ± 2 L, sl. Y	-	-	-	-	-
A 261	FA 6	+	± sl.	-	-	-	-
A 283	FA 11	-	1 ± 2 -	-	-	-	-

* Triplicate Inoculations

GTPn	glyceryl triproprionate
GTB	glyceryl tributyrate
GTS	glyceryl tristearate
GTO	glyceryl trioleate
GMR	glyceryl monorincinoleate
CA	cholesterol acetate

+	positive
-	negative or no change
Y	yellow (negative)
L	lighter than uninoculated control (negative)
sl.	slight

APPENDIX I

TECHNIQUES

A. AEROBIC CULTURING TECHNIQUES

1. Primary Culturing Technique

The primary aerobic culturing of the rectal samples was carried out at the 6571st Aeromedical Research Laboratory, Holloman Air Force Base, Alamogordo, New Mexico by spreading the differential media listed in Appendix II with 0.1 ml of the broth from tube 1 in the dilution series.

The aerobic counting plates were made from the anaerobic broth dilution series so that comparisons could be made of the relative numbers of aerobic and anaerobic bacteria carried in the same sample. The fecal aerobic "count" was made by placing 1 ml broth of tube 3 of the anaerobic broth series into a Petri plate to which was added 10 ml of Gall's agar. The colonies were enumerated after 24 hours. Rogosa's agar was used as a pour plate and 1 ml from tube 1 was added to 1.0 ml of this agar.

2. Secondary Culturing Technique

The agar plate cultures following incubation were sealed with a plastic sealer, refrigerated and returned to the Republic laboratories for further study. Selected colonies from each plate were picked into nutrient broth and all cultures showing growth were stained by the Hucker modification of the Gram stain and observed microscopically. The various morphological types of bacteria were separated into appropriate categories for identification by the following schema:

a. Blood Agar

(1) Colonies

(a) Described

(b) Representative colonies planted in nutrient broth

(2) Broth

(a) Incubated

(b) Slides made for morphological identification

(3) Morphological Grouping

(a) Staphylococci and Micrococci

- Mannitol salt agar
- All positives confirmed with coagulase test
- Phage typing on selected cultures

(b) Streptococci

- Alpha hemolysis
- Beta hemolysis
- Gamma Hemolysis
- Differential sugars
- Typing

(c) Pneumococci

- Pneumococcus broth - bile solubility

(d) Haemophilus

- Identified with typing antisera

(e) Neisseria

- Sugar screen test

(f) Lactobacillus

- Morphology on Rogosa's
  (Sampling period 1, 2 and 3)
- Fermentation pattern
  (Sampling period 4)

(g) Gram Positive Rods

- Loeffler's
- Ziehl Neelsen
- Sporulation
- Gelatin
- Sugar screen
- Hydrolysis of starch
- Detection of hyphae (Proactino or Nocardia)
- Tellurite
- Catalase
- Hemolysis on sheep blood
- CO_2 requirement

(h) Gram Negative Rods

- TSI
- Indol
- Methyl red
- Voges-Proskauer
- Simmon's citrate
- Urease
- Nitrate
- Motility
- Gelatin
- KCN
- Phenylalanine
- Cytochrome oxidase (on all alkaline over alkaline TSI's)
- Typing antiseria (Shigella, Salmonella, E. coli, Klebsiella)

b. MacConkey's, BS, BG, SS

(1) Treated as under (h)

c. Tetrathionate Broth

(1) Plated on MacConkey's, BS, BG, and SS

(2) Treated as under (h)

d. Mitis-Salivarius

(1) Colonies observed and described for identification of S. mitis, S. salivarius, and enterococci

e. Rogosa's S. L. Agar

(1) Colonies

(a) Morphological identification

(b) Slides made for morphological identification

(c) Fermentation pattern in sampling period 4

f. Phytone Yeast Media

(1) Colonies

(a) Described

(b) Planted onto cornmeal agar

- Growth observed for sporulation

g. PPLO

(1) Dienes' stained agar technique

h. Blood Agar Flask

(1) Blood broth (morphology)

(2) Darkfield when indicated

(3) Vincent's stain

A Gram stain was made from the original swabs to observe the types of bacteria present in the original samples.

The composition of the media used and the method of incubating and reading the various media is described in detail on the following pages.

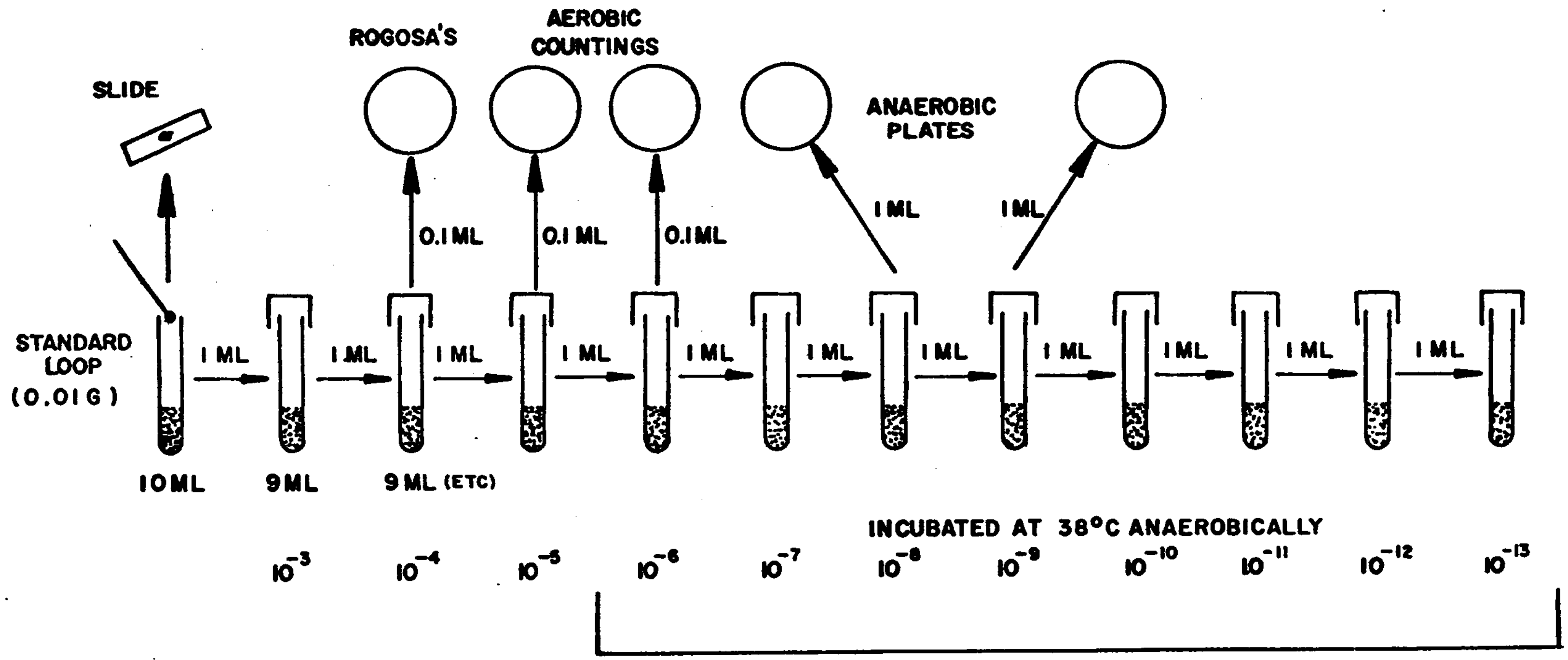
B. ANAEROBIC CULTURING TECHNIQUES

The anaerobic culturing techniques to be described include the primary culturing and the screen tests.

1. Primary Culture

The anaerobic broth series for the primary culture of the fecal swab was essentially the same as that used previously by Gall, et al[45] for culturing rumen anaerobes, and which has been recently successfully adapted in the Republic laboratories to the culture of human feces.[37] This is a technique that can be adapted easily to work under field conditions. Figure 1 gives a schematic representation of the primary culturing technique, which was modified to culture from a rectal swab. It was assumed that the rectal swab carried about 0.01 gm of fecal matter, which is comparable to the amount of fecal matter adhering to the standard loop.

The rectal swab was placed directly into a tube containing 10 ml of Gall's broth prepared with two drops of cysteine and one drop of sodium bicarbonate. This tube was considered to represent roughly a 10^{-3} dilution to the rectal contents. Serial dilutions were made into 11 additional tubes with 10 ml of Gall's broth prepared as above by transferring 1 ml from the inoculated tube into the next tube, etc., the top 10 of which were labeled 1 to 10 and were incubated for five days or until growth occurred. Observations were made at 16 and 24 hours and daily thereafter. These ten tubes were considered to approximate a dilution of the sample from 10^{-4} to 10^{-13}. No dilution blanks were used, as each tube containing broth acts as a dilution blank for the next tube in the series. From tubes 5 and 6 pour plates were made into anaerobic Petri dishes using Gall's medium with cysteine and bicarbonate added. The top three tubes showing growth were subcultured into agar shakes using Gall's medium to observe the anaerobic or aerobic character of the growth and to preserve the cultures for purification and study. Each culture was stained by Hucker's modification of the Gram stain and the slide was observed microscopically. Cultures from the top three dilutions of feces showing two or more distinct morphological types of bacteria were



Note: The anaerobic dilution series was modified in certain instances, but all calculations reflect this format.

Figure 1. Anaerobic Dilution Series

purified by plating and picking colonies using Gall's agar in an anerobic Petri dish. Selected colonies on the anaerobic Petri dishes originating from tubes 5 and 6 were picked and treated like the subcultures from the agar shakes as described above. Usually 4 to 6 different colony types appear on each anaerobic Petri plate adding 6 to 8 pure cultures to be run through the screen tests. During the fourth sampling period lower dilution anaerobes were treated as above.

In addition blood plates were streaked from the anaerobic swabs from the rectum by the same technique as the aerobic plates, and were incubated in the same anaerobic jar as the anaerobic broth series. Growth was recorded after 24 hours and the plates were treated in the same manner as the aerobic blood plates.

The compositions of the media and solutions used in this technique are listed below:

a. Gall's Media

1% Peptone C (Albimi)[46]
1% Peptone S (Albimi)[46]
1% Beef Extract (Difco)[47]
1% Yeast Extract (Difco)[47]
0.1% K_2HPO_4
0.1% KH_2PO_4
0.1% Glucose

Make up to 100 ml with distilled water and tube in 9 ml amounts (pipetted for exactness of dilution) and sterilize exactly 10 minutes by autoclaving. Immediately before use, add aseptically 1 drop of sterile 10% $NaHCO_3$ and two drops of 10% cysteine-bicarbonate solution. This gives a pH of approximately 6.8 and an Eh of approximately -200 mv. Add 1.5% agar to the above when agar is needed for shakes and plates. This is done when originally making the media. In agar omit cysteine except where noted otherwise. To all broth and agar media 0.05% of bovine serum is added.

b. 10% Cysteine-Bicarbonate Solution

20 gm Cysteine Hydrochloride

100 ml 1N NaOH

7% $NaHCO_3$

Add the cysteine hydrochloride to the NaOH, giving an approximate pH of 7.0.

More or less NaOH will be needed depending on the particular batch of cysteine hydrochloride.

To 4 ml of this solution (15% as cysteine) in a test tube, add 2 ml of 7% $NaHCO_3$.

Seal with melted vaspar. Autoclave at 15 lb for 10 minutes.

2. <u>Physiological Studies</u>

The physiological studies of the pure cultures of predominating flora included the following screen tests:

a. Gram stain to observe morphology

b. Final pH in 0.1% glucose broth

c. Fermentation of the following sugars in Gall's media with glucose omitted:

(1) Glucose

(2) Sucrose

(3) Lactose

(4) Dextrin

(sugars added at 0.1% level aseptically after autoclaving)

d. Growth in Gall's broth with no carbohydrate added

e. Liquefaction of gelatin in Gall's media minus carbohydrate

f. Growth and reaction in litmus milk (to which 0.05% bovine albumin and 0.1% of peptone have been added)

g. Growth in agar shake containing Gall's media

All media contained bicarbonate and all media except the agar shake contained cysteine to produce an Eh of about -200 mv. The results of the screen test on each anaerobic culture were compared with a "key" setup with anaerobic cultures isolated in a NASA study on the predominating fecal flora of man[37] which appears in Table 18 . When possible the cultures isolated from the chimpanzee were assigned a designation (FA or FN) from the human "key". Otherwise the culture was tabulated as "unkeyed". In the event that several of these "unkeyed" cultures were alike, a new designation (CT or CN) was setup which is described also in Table 18.

APPENDIX II

MEDIA COMPOSITION

BLOOD AGAR PLATE

Purpose: Cultivate fastidious microorganisms

Formula:

Base	Gms/Liter
Infusion from beef heart	10.0
Peptone "M"	10.0
Sodium chloride	5.0
Agar	15.0

pH 6.9

Then add:

5% defibrinated sheep blood

Technique: Streak the plate with the original specimen or a subculture from broth.

Procedure: Incubate 37°C for 18-24 hours

Reaction: Colonies of bacteria usually grow luxuriantly, and the hemolytic types exhibit clear distinct degrees of hemolysis.

Reference: Difco Manual,[47] p. 88.

MITIS SALIVARIUS AGAR

Purpose: The detection of fecal streptococci. Incubate exactly 24 hours at 37°C.

Formula:

Base	Gms/Liter
Peptone "M"	20.0
Dextrose	1.0
Sucrose	50.0
Di Potassium Phosphate	4.0
Agar	15.0
Trypan Blue	0.075
Crystal Violet	0.0008

pH 7.0

Technique: Streak the plate with the inoculum.

Reaction:
Streptococcus mitis: small or minute colonies
Streptococcus salivarius: blue (smooth or rough), gum drop colonies 1-5 mm
Enterococcus: dark blue or black raised colonies
Coliform: brown colonies
Pleuro-pneumonia: colorless mucoid colonies

Reference: Albimi Laboratories[46]

ROGOSA'S S. L. AGAR

Purpose: SL Agar is a selective medium for the cultivation of oral and fecal lactobacilli

Formula:

Base	Gms/Liter
Peptone "C"	10.0
Yeast extract	5.0
Monopotassium phosphate	6.0
Ammonium citrate	2.0
*Salt solution	5.0 ml
Dextrose	20.0
Sorhitan Mono-oleate	1.0
Sodium Acetate Hydrate	25.0
Agar	15.0
Acetic acid	1.32

pH 5.4

*Salt Solution:

Magnesium sulfate $7H_2O$	11.5 gms
Magnesium sulfate $2H_2O$	2.4 gms
Magnesium sulfate $4H_2O$	2.8 gms
Ferrous sulfate $7H_2O$	0.68 gms
Distilled water	1000.0 ml

Technique: Melt agar then cool in water bath to 45°C. Add a drop of broth culture to agar; then make a pour plate.

Procedure: Incubate under partial anaerobic conditions.

Reaction: Selective for cultivation of lactobacilli

Reference: Difco Supplementary Literature,[44] p. 59

PHYTONE YEAST (BBL)

Purpose: For the isolation of dermatophytes especially T. nerrucosa from human and animal specimens.

Formula:

Base	Gms
Phytone	10
Yeast Extract	5
Dextrose	40
Streptomycin	.03
*Chloramphenicol	.05
Agar (dried)	17

*Chloromycetin TM Parke Davis & Co.

Technique: Streak slant directly with heavy inoculum of fecal suspension or other suspicious material.

Reaction: Typical colonies of the dermatophytes grow rapidly on phytone yeast agar.

Reference: Baltimore Biological Laboratories[48]

MAC CONKEY'S AGAR

Purpose: Primary differential plating media for coliforms.

Formula:

Base	Gms/Liter
Peptone "M"	10.0
Lactose	10.0
Bile salts	1.5
NaCl	5.0
Agar	15.0
Neutral Red	0.025

pH 7.1

Technique: With an inoculating loop, streak the plate with the original specimen or subculture from a broth culture.

Procedure: Incubate plate at 35-37°C for 16-18 hours. Prolonged incubation may lead to confusion of results.

Reaction: Isolated colonies of coliform bacteria are brick red in color and may be surrounded by a zone of precipitated bile. This reaction is due to the action of the acids, produced by fermentation of lactose, upon the bile salts and the subsequent absorption of neutral red. Typhoid, paratyphoid and dysentery bacilli do not ferment lactose and do not greatly alter the appearance of the medium. These colonies are uncolored and transparent.

Reference: Difco Manual,[47] p. 131-132.

SALMONELLA AND SHIGELLA AGAR

Purpose: This selective medium is recommended for the isolation of shigella and salmonella from stools and other materials suspected of containing these organisms.

Formula:

Base	Gms/Liter
Peptone "M"	5.0
Beef extract	5.0
Lactose	10.0
Bile salts	8.5
Sodium citrate	8.5
Sodium thiosulfate	8.5
Ferric citrate	1.0
Agar	13.5
Neutral red	0.025
Brilliant green	0.33

pH 7.0

Technique: With an inoculating loop, streak the plate with the original specimen or subculture from a broth culture.

Procedure: Incubate plates at 35-37°C for a full 24 hours.

Reaction: Shigella, salmonella and other organisms not fermenting lactose form opaque, transparent or translucent uncolored colonies, which generally are smooth.

Reference: Difco Manual, [47] p. 135.

TETRATHIONATE BROTH

Purpose: This selective enrichment medium is employed in the isolation of members of the Salmonella group.

Formula:

Base	Gms/Liter
Proteus Peptone	5
Bile salts	1
Calcium carbonate	10
Sodium Thiosulfate	30

Technique: Inoculate the broth by addint 1-3 gms of the original stool specimen. Mix the broth with a glass rod or pipette to suspend the particulate matter.

Procedure: Incubate at 37°C for 12-24 hours

Reaction: Tetrathionate broth inhibits or kills the coliform organisms and permits typhoid and the paratyphoids to grow almost unrestrictedly. If growth is present, subculture to differential and selective solid medium to aid in identification.

Reference: Difco Manual,[47] p. 157.

TRIPLE SUGAR IRON (TSI)

Purpose: Preliminary screening of gram rods

Formula:

Base	Gms/Liter
Peptone "M"	20.0
Lactose	10.0
Saccharose	10.0
Dextrose	1.0
Sodium Chloride	5.0
Iron Ammonium Citrate	0.5
Sodium Thiosulfate	0.5
Agar	15.0
Phenol Red	0.025

pH 7.3±

Technique: Using needle with inoculum, go into butt first, then zig zag on slant while withdrawing needle from butt. Incubate 20-24 hours.

Reaction: Acid butt (yellow), alkaline slant (red) - Glucose fermented acid throughout medium, butt and slant yellow - lactose or sucrose or both fermented. Blackening of the butt - hydrogen sulfide produced. Alkaline slant and butt (medium entirely red) - none of the three sugars fermented.

Reference: Albimi Laboratories[46]

BISMUTH SULFITE AGAR

Purpose: Bacto-Bismuth Sulfite Agar is a highly selective medium designed especially for the isolation of salmonella typhosa from feces, urine, sewage and other materials harboring this organism.

Formula:

Base	Gms
Bacto-Beef Extract	5
Bacto Peptone	10
Bacto Dextrose	5
Disodium Phosphate	4
Ferrous Sulfate	3
Bismuth Sulfite Indicator	8
Bacto Agar	20
Bacto-Brilliant Green	.025

Technique: Streak or smear the surface of a plate with a heavy inoculum of the fecal material in such a way that on some portion of the plate the inoculum will be light, permitting the development of discrete colonies.

Reaction: The typical discrete surface typhoid colony is black and is surrounded by a black or brownish-black zone which may be several times the size of the colony. By reflected light, preferably daylight, the zone exhibits a distinctly characteristic metallic sheen.

Reference: Difco Manual,[47] p. 139.

BRILLIANT GREEN AGAR

Purpose: Brilliant green agar is a highly selective medium recommended for the isolation of salmonella, other than typhosa, directly from stools or other materials suspected of containing these organisms or after preliminary enrichment in tetrathionate broth.

Formula:

Base	Gms
Bacto Yeast Extract	3
Proteus Peptone No. 3, Difco	10
Sodium Chloride	5
Bacto Lactose	10
Saccharose, Difco	10
Bacto Phenol Red	.08
Bacto Brilliant Green	.0125
Bacto Agar	20

Technique: Inoculate the surface of the plate with heavy suspensions of stools or other materials suspected of containing salmonella.

Reaction: Typical salmonella colonies appear as slightly pink-white opaque colonies surrounded by a brilliant red medium. The few lactose or sucrose fermenting organisms which may develop on the medium are readily differentiated due to the formation of a yellow-green colony surrounded by an intense yellow-green zone.

Reference: Difco Manual,[47] p. 145.

INDOL BROTH

Purpose: Part of IMVIC schema for identifying Enterobacteriaceae

Formula: Base

Bacto peptone	20 gms
Sodium chloride	5 gms
Distilled water	1000 ml

Sterilize at 121°C 15 minutes. Add 10 cc/tube

Technique: Inoculate broth and incubate for 48 hours at 37°C

Test Reagent: Kovac's

Pure amyl of isoamyl alcohol	150 ml
Paradimethylaminobenzaldehyde	10 gms
Concentrated pure hydrochloric acid	50 ml

Dissolve aldehyde in alcohol and then slowly add acid. The dry aldehyde should be light in color. Kovac's reagent should be prepared in small quantities and stored in the refrigerator when not in use.

Procedure: Add about 0.5 ml of reagent, shake tube gently. A deep red color develops in the presence of indol.

Reaction: The red color indicates production of indol from the amino acid.

Reference: Edwards & Ewing,[49] p. 248.

METHYL RED–VOGES PROSKAUER BROTH (MRVP)

Purpose: Part of IMVIC schema for identifying Enterobacteriaceae

Formula:

Buffered peptone (Peptone M)	7 gms
Glucose	5 gms
Dipotassium phosphate	5 gms
Distilled water	1000 ml

Final pH 6.9 - adjust with HCl to 7.1 or 7.2 before autoclaving.

Technique:

MR: Inoculate 5 cc of broth and incubate at 37°C for 5 days.

VP: Inoculate 5 cc of broth and incubate at 37°C for 2 days.

Test Reagent:

MR:

Methyl red	0.1 gm
Ethyl alcohol (95 to 96%)	300 ml
*Water - Q.S. to	500 ml

* Dissolve dye in the alcohol and add sufficient distilled water to make 500 ml.

VP: O'Meara (modified)

Potassium hydroxide	40 gms
Creatine hydrate	0.34 gm
Distilled water	100 ml

Procedure:

MR: Use 5 or 6 drops of reagent per 5 ml of culture. Reactions are read immediately.

Positive tests are bright red.
Weakly positive tests are red-orange.
Negative tests are yellow.

VP: Use reagent in proportion of 1 ml to 1 ml culture. Test may be placed at 37°C or left at room temperature. In either case, final readings after 4 hours. Tests should be aerated by shaking tubes. A positive test turns red.

Reaction:

MR: A positive reaction is indicated by a distinct red color showing the presence of acid. A negative reaction is indicated by a yellow color.

VP: A positive test is indicated by the color showing that the organism produces acetylmethylcarbinol.

Reference: Edwards & Ewing,[49] pgs. 249 and 256.

UREASE BROTH

Purpose: Rough grouping of Enterobacteriaceae into proteus, klebsiella, aerobacter or providence group.

Formula:

Base	Gms/Liter
Urea	20.0
Monopotassium Phosphate	9.1
Disodium Phosphate	9.5
Yeast Extract	0.1
Phenol Red	0.01

pH 6.8 ±

Technique: A heavy inoculum is emulsified in the broth. Incubate 24 hours. Read at 2, 4, and 24 hour intervals.

Reaction: Urease activity is observed by a change of color in the indicator - from salmon to pink - due to the production of ammonia.

Reference: Albimi Laboratories[46]

* * *

MOTILITY TEST MEDIUM

Purpose: Part of IMVIC schema for identifying Enterobacteriaceae

Formula:

Beef extract	3 gms
Peptone	10 gms
Sodium Chloride	5 gms
Agar	4 gms

Technique: The medium is inoculated by stabbing through the center of the medium about 1/3 of the length of the media and incubated at 37°C for a total of 48 hours. Read at 8, 24 and 48 hour intervals.

Reaction: Motility is manifested macroscopically by a diffuse zone of growth spreading from the line of inoculation. Certain species of motile bacteria will show diffuse growth throughout the entire medium, while others may show diffusion from one or two points only, appearing as modular outgrowths along the stab.

Reference: Edwards & Ewing,[49] p. 249.

PHENYLALANINE

Purpose: Part of IMVIC schema for identifying Enterobacteriaceae

Formula:

Base	Gms
Yeast extract	3
DL-phenylalanine	2
(or L-phenylalanine)	(1)
Disodium phosphate	1
NaCl	5
Agar	12
Distilled water	1000 ml

Tube and sterilize at 121°C for 10 minutes.

Technique: Inoculate broth and incubate 24 hours at 37°C.

Test Reagent: 10% Ferric Chloride

Procedure: 4 or 5 drops of ferric chloride reagent are allowed to run over growth on slant. If phenylpyravic acid has been formed a green color develops in the syneresis fluid in the slant.

Reaction: The medium is used to test for the deamination of phenylalanine to phenylpyruvic acid.

Reference: Edwards & Ewing[49] p. 252.

SIMMONS CITRATE AGAR SLANT

Purpose: Part of IMVIC schema for differentiation of lactose-fermenting Enterobacteriaceae

Formula:

Base	Gms/Liter
Sodium Citrate	2.0
Sodium Chloride	5.0
Ammonium Dihydrogen Phosphate	1.0
Dipotassium Phosphate	1.0
Magnesium Sulfate	0.2
Agar	15.0
Brom-Thymol Blue	0.08

pH 6.8 ±

Technique: Using a loop, inoculate lightly, incubate at 37°C for 48 hours and read.

Reaction: A positive test is indicated by the development of a Prussian blue color in the medium, showing that the organism can utilize citrate as a sole source of carbon.

Reference: Albimi Laboratories[46]

OXIDASE TEST FOR PSEUDOMONAS

Purpose: This rapid test allows for a convenient differentiation between pseudomonas and other gram-negative, lactose-negative colonies.

Formula: Reagent

A.	Ethylalcohol 95-96%	100 ml
	Alphanaphthol	1 gm
B.	Distilled water	100 ml
	Para-aminodimethylaniline HCl	1 gm

(Reagent B should be prepared frequently and should be stored in refrigerator when not in use.)

Technique: Nutrient agar slant cultures incubated at 37°C, or at a lower temperature if required are recommended. After incubation two or three drops of each reagent are introduced and the tube tilted so that the reagents are mixed and flow over the growth on the slant.

Reaction: Positive reactions are indicated by the development of a blue color in the growth within two minutes. The majority of positive cultures produce strong reactions within 30 seconds. Any very weak or doubtful reaction that occurs after two minutes should be ignored. Plate cultures may be tested by allowing an equal parts mixture of the reagents to flow over isolated colonies.

Reference: Bailey and Scott,[50] p. 160; Edwards & Ewing,[49] p. 251-2.

NITRATE BROTH

Purpose: Part of IMVIC schema for identifying Enterobacteriaceae

Formula:

Base	Gms
Meat Extract	3
Peptone	5
Potassium Nitrate	1
Distilled Water	1000 ml

Put in 5 cc/tube

Technique: Inoculate broth and incubate 48 hours at 37°C.

Test Reagent:

A. Dissolve 8 gms sulfanilic acid in 1000 ml 5 N acetic acid.

B. Dissolve 5 gms alphanaphtylamine in 1000 ml of 5 N acetic acid.

Procedure: Immediately before use, equal parts of A and B are mixed and 0.1 ml of mixture is added to each culture. A positive test for reduction of nitrate to nitrite is a red color in few minutes.

Reaction: The red color indicates the reduction of nitrates to nitrites.

Reference: Edwards & Ewing[49] p. 250.

BACTO-KCN BROTH BASE

Purpose: KCN broth base is recommended for the differentiation of Enterobacteriaceae, particularly to separate the salmonellae from the Bethesda-Ballerup group and to distinguish the klebsiella from Escherichia coli. Maeller showed that media containing potassium cyanide permitted differential growth of Enterobacteriaceae. E. coli, salmonella and shigella were inhibited in the medium while members of the klebsiella, Bethesda-Ballerup and Proteus groups grew unrestrictedly. E. freundii also grew in the medium.

Formula:

Base	Gms
Proteose Peptone No. 3 Difco	3
Disodium Phosphate	5.64
Monopotassium Phosphate	.225
Sodium Chloride	5
KCN (add 15 cc of .5%)	15 cc

Technique: The tubes are inoculated heavily with 1 to 3 loops of a 24 hour broth culture of the test organisms.

Reaction: Observations for growth are made at the end of 24 and 48 hours incubation.

Reference: Difco Supplementary Literature[44] p. 122.

MANNITOL SALT AGAR

Purpose: Isolation and identification of Staphylococci

Formula:

Base	Gms/Liter
Peptone "M"	10.0
Beef Extract	1.0
Sodium Chloride	75.0
d-Mannitol	10.0
Agar	15.0
Phenol Red	0.025

pH 7.4

Technique: Streak the media with heavy inoculum of original material or with an inoculating loop streak from a secondary broth culture.

Reaction: Staphylococci are not inhibited by a concentration of 7.5 per cent sodium chloride. Pathogenic staphylococci produce colonies with yellow zones while nonpathogenic staphylococci produce small colonies surrounded by red or purple zones.

Reference: Albimi Laboratories[46]

LOEFFLER BLOOD SERUM AGAR

Purpose: Loeffler Blood Serum is employed in the cultural diagnosis of diphtheria. The growth of diphtheria bacilli are stimulated and other throat organisms are inhibited by this media.

Formula:

Base	Gms/Liter
Beef serum	70
Dextrose broth infusion	2.5
Whole egg	7.5

Technique: Inoculate slant with original swab obtained from throat or subculture from broth with aid of inoculating loop. Incubate at 37°C for 18-24 hours.

Reaction: On Loeffler Blood Serum C. diphtheria grow luxuriantly and rapidly, developing morphologically typical organisms, in 12-16 hours.

Reference: Albimi Laboratories[46]

GLYCEROL AGAR

Purpose: Glycerol agar is a non-selective agar medium often used for cultivating tubercle bacilli.

Formula:

Base	Gms
Beef Heart Infusion	500
Bacto Tryptone	10
Sodium Chloride	5
Bacto Agar	15
Glycerol	5%

Technique: Inoculate the glycerol agar slant directly with the fecal suspension or other material suspected of containing the tubercle bacilli.

Reaction: Typical colonies of the tubercle bacilli are formed.

Reference: Difco Supplementary Literature[44] p. 225.

* * *

GALL'S GELATIN (i. e. 12%)

Purpose: The use of gelatin in culture media for studies of gelatinolysis (elaboration of gelatinolytic enzymes) by bacteria.

Formula:

Base	Gms
Bacto tryptone	10
Bacto peptone	10
Bacto yeast extract	10
Bacto beef extract	10
Monobasic potassium-phosphate	1
Dibasic potassium phosphate	1
Serum	1 cc
Gelatin	120

LITMUS MILK

Purpose: Litmus milk is recommended for propagating and carrying stock cultures of the lactic acid bacteria and also for determining the action of bacteria, upon milk.

Formula:

Base	Gms
Bacto Skim milk	100
Bacto Litmus	.75

Technique: Inoculate litmus milk from a suspension of the test organism or directly from an isolated colony.

Reaction: Litmus milk may be employed as a differential medium for bacteria on the basis of lactose fermentation, caseolysis, and casein coagulating properties. Litmus has the advantage of being readily reduced by certain bacteria. This reduction of the litmus is useful as a differential aid.

Reference: Difco Manual[47] p. 192.

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CORN MEAL AGAR

Purpose: Corn meal agar is recommended for the production of chlamydospores by Candida albicans and for the cultivation of phytopathological and other fungi.

Formula:

Base	Gms
Corn Meal, Infusion from	50
Bacto Agar	15

Technique: Streak surface of the corn meal plate directly with suspicious material or with a culture that grew on preliminary solution medium.

Reaction: Typical chlamydospores are produced by Candida albicans.

Reference: Difco Manual[47] p. 246.

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13. ABSTRACT Cultures isolated from rectal swabs obtained from 100 chimpanzees, as well as from two fecal samples from five chimpanzee handlers, were studied. The data obtained from the aerobic bacterial studies were summarized in tables grouping the occurrence of the Enterobacteriacea, streptococcus, and miscellaneous aerobes so that comparisons could be made with the results obtained on two prior studies. The data of the occurrence of the anaerobic bacterial cultures were summarized in tables as obligate or facultative anaerobes, using the same method of grouping the cultures as in prior studies. Differences in the anaerobic character of chimpanzees and human fecal populations was noted; the percentage of obligate anaerobes exceeding 90% for the human cultures, and ranging between 26% and 71% for the chimpanzee cultures. A literature survey was conducted to aid in the evaluation of the potential pathogenicity of bacterial strains isolated from the chimpanzee. A remarkable similarity exists in the aerobic flora of primates, although differences in the pathogenicity of particular species of bacteria for various primate hosts have been reported in the literature. Carrier states are prevalent in the chimpanzee. The anaerobic fecal population of the chimpanzee differs from man.

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